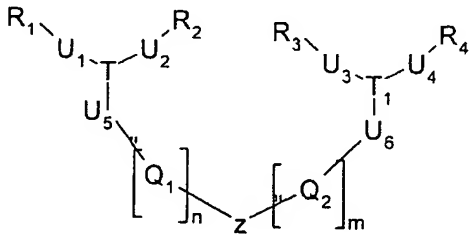
AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-24 (Canceled)

25. (New) A process for hydrocyanating a hydrocarbon compound containing at least one ethylenic unsaturation by reacting it in a liquid medium with hydrogen cyanide in the presence of a catalyst comprising a metallic element selected from transition metals and an organic ligand, wherein the organic ligand corresponds to the general formula I below:



(I)

in which:

T and T_1, which are identical or different, represent a phosphorus, arsenic or antimony atom,

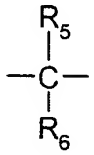
U_1, U_2, U_3, U_4, U_5, and U_6, which are identical or different, represent an oxygen atom or a radical NR, R representing an alkyl, aryl, sulphonyl or carbonyl radical,

R_1, R_2, R_3 and R_4, which are identical or different, represent a substituted or unsubstituted, aromatic, aliphatic or cycloaliphatic radical having one or more rings, which are in fused form or not and which optionally contain one or more heteroatoms, where the radicals R_1 and R_2 on the one hand and R_3 and R_4 on the

other hand are optionally interconnected by a covalent bond, a hydrocarbon chain or a heteroatom, and, when one of the radicals U_1, U_2, U_3 and U_4 includes an N atom, the associated radical R_1, R_2, R_3 or R_4 optionally form a ring including the N element of said radical,

m and n are identical or different integers between 0 and 6, where m + n must be greater than or equal to 1,

Q_1 and Q_2, which are identical or different, represent a group corresponding to the general formulae II, III or IV below: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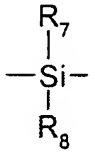
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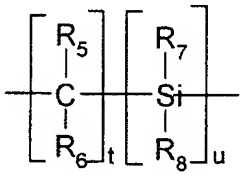
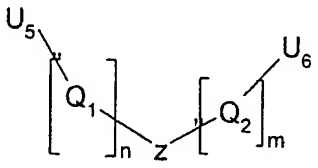

(IV)

in which R_5, R_6, R_7 and R_8, which are identical or different, represent aliphatic, cycloaliphatic or aromatic hydrocarbon radicals having 1 to 12 carbon atoms, R_5 and R_6 also representing the hydrogen atom, and

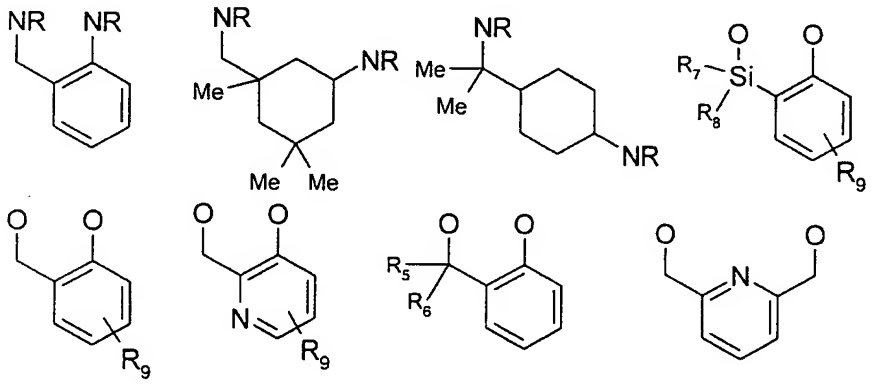
t and u represent integers between 0 and 6, with a sum u + t greater than or equal to 1,

Z representing a divalent radical selected from the group consisting of aromatic or cycloaliphatic radicals containing one or more rings, which are in fused form or not and which are optionally substituted and optionally contain heteroatoms.

26. (New) The process according to Claim 25, wherein the ligand of formula I comprises a structure of the formula below:

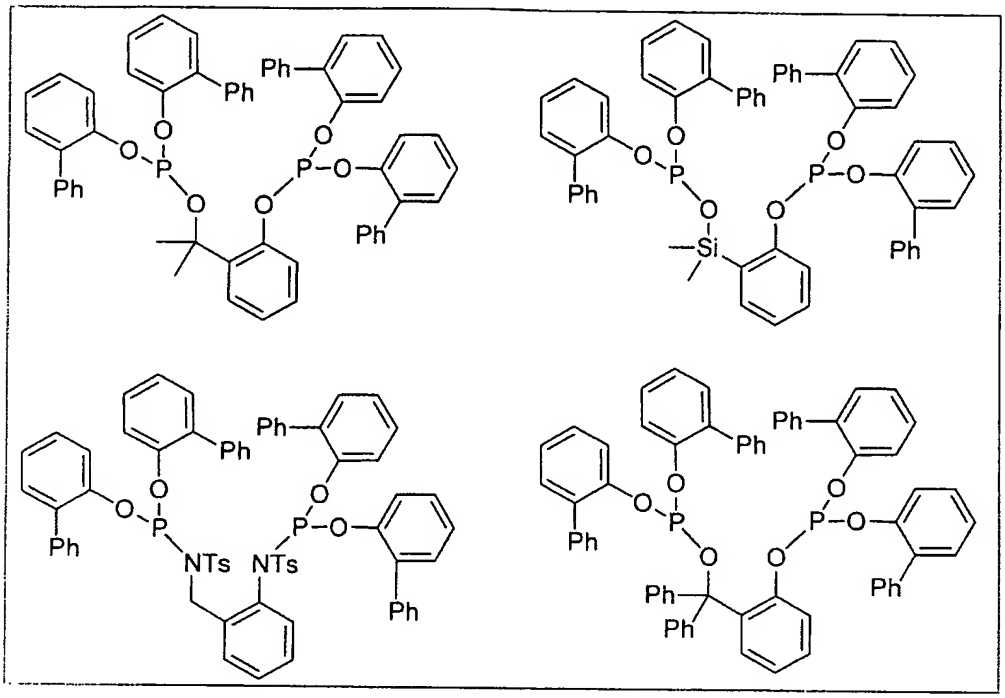


selected from the group consisting of the following structures:



in which R_9 represents a halogen atom, alkyl, an aryl, alkoxy, aryloxy, nitro, thioalkyl, secondary amine or nitrile group.

27. (New) The process according to Claim 25, wherein the organic ligand is selected from the group consisting of the compounds of the formula below: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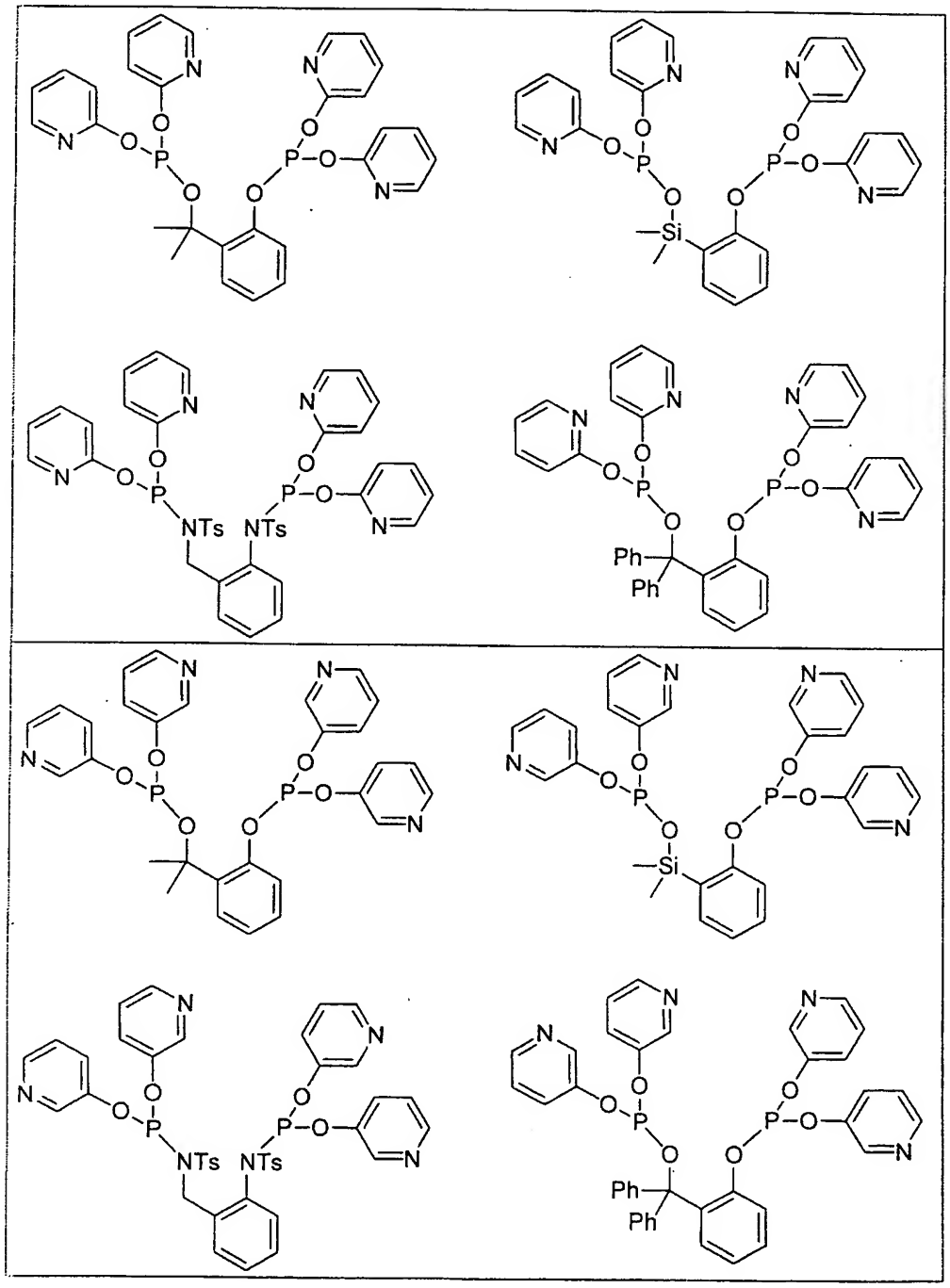
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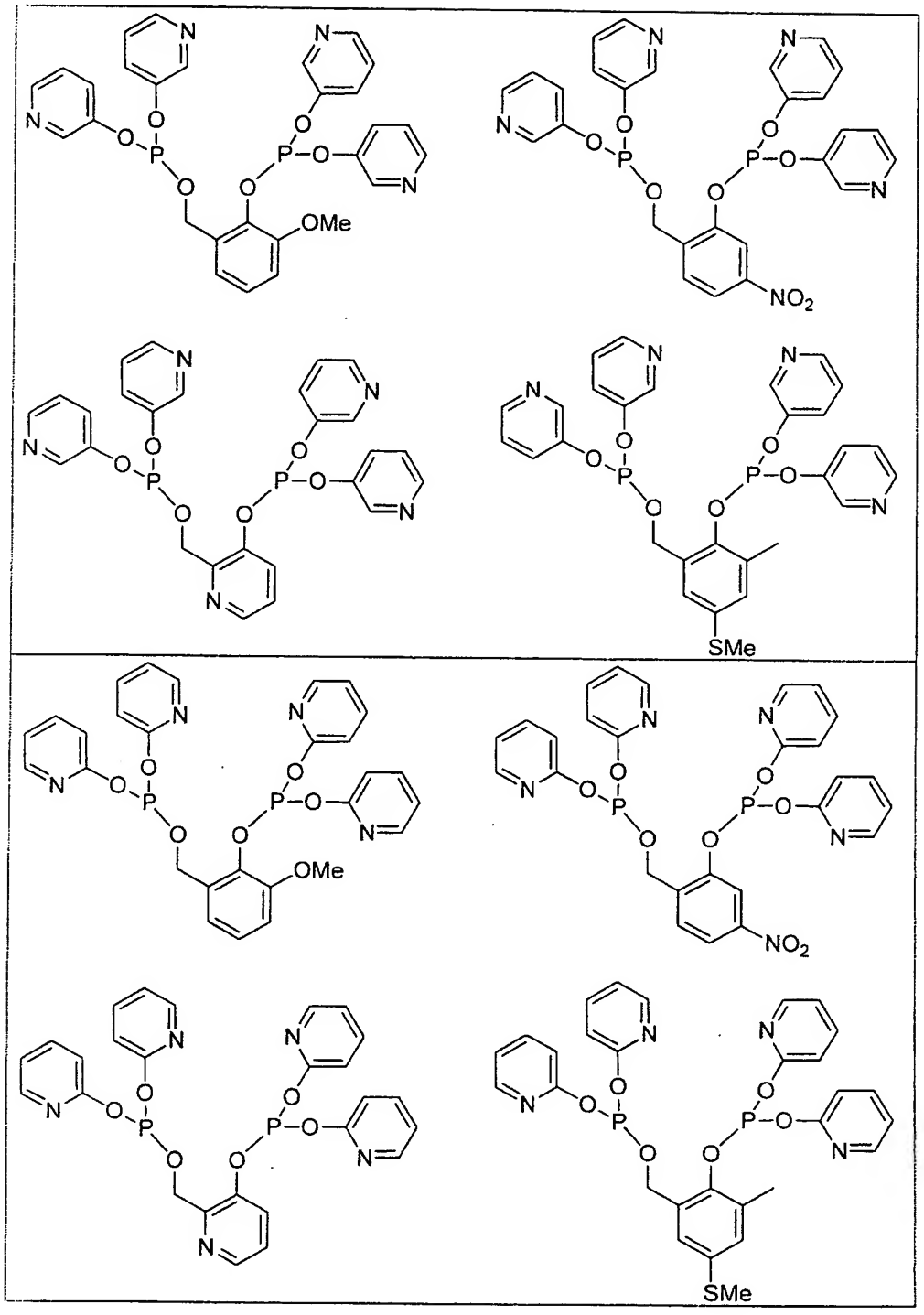
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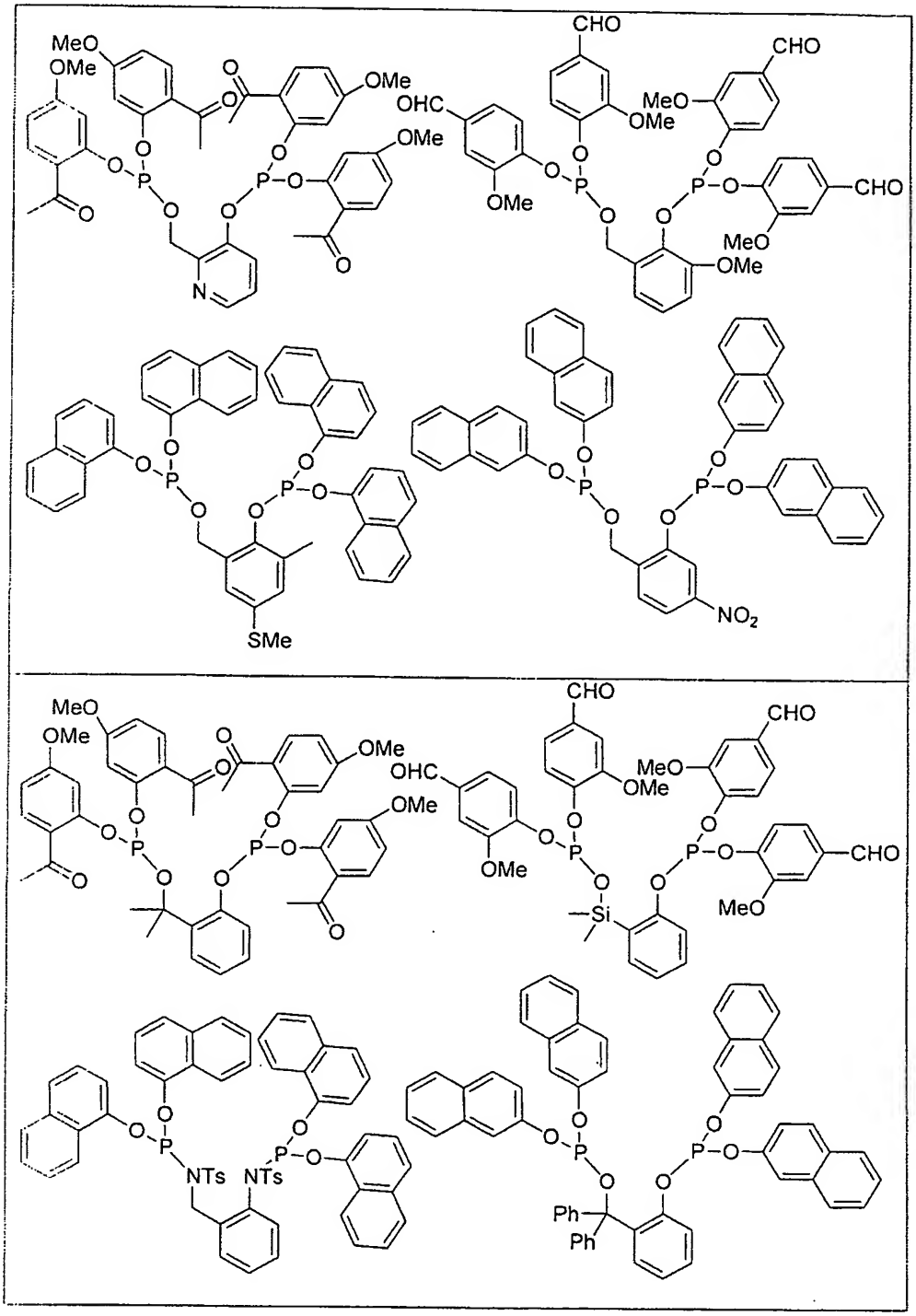
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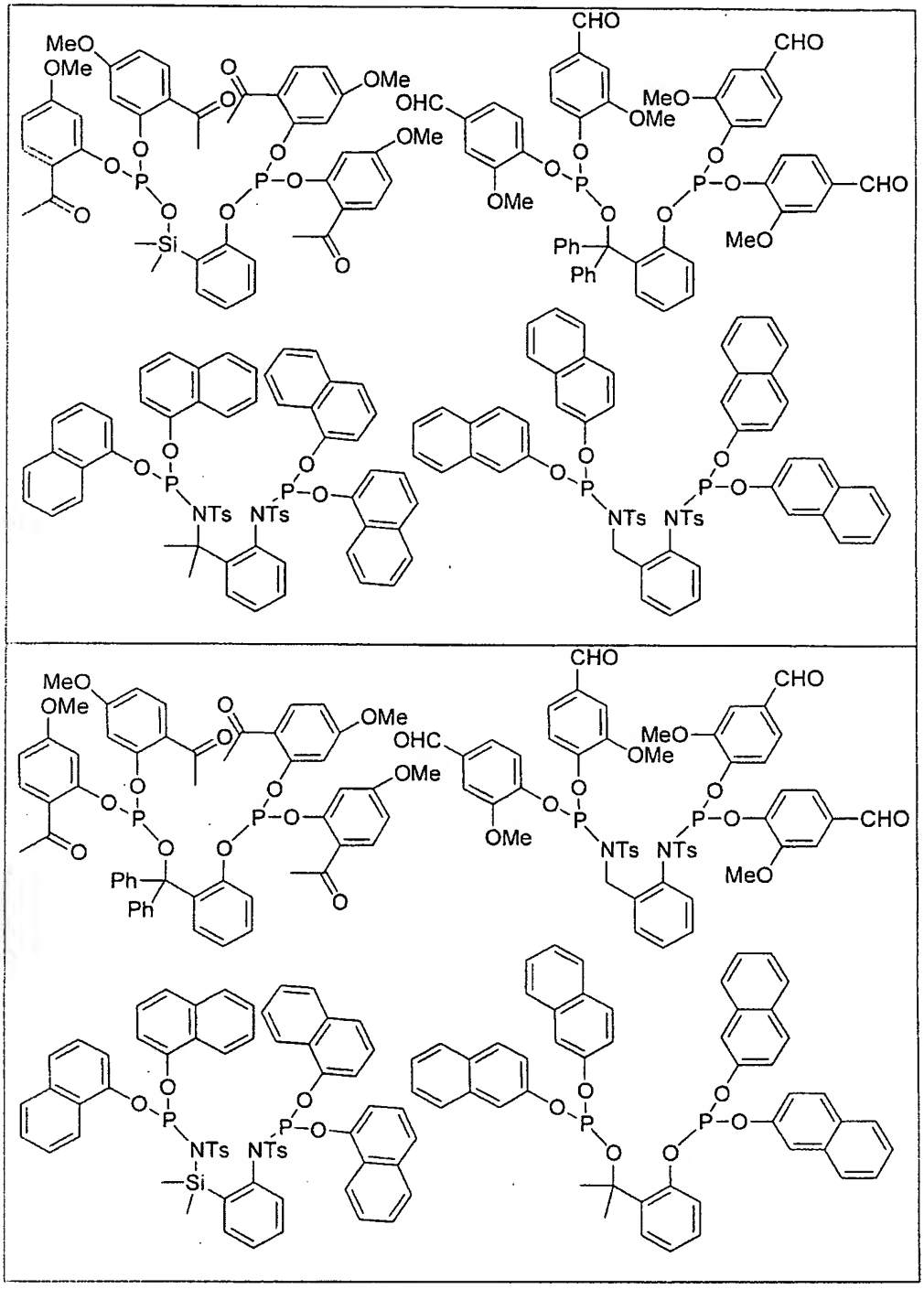
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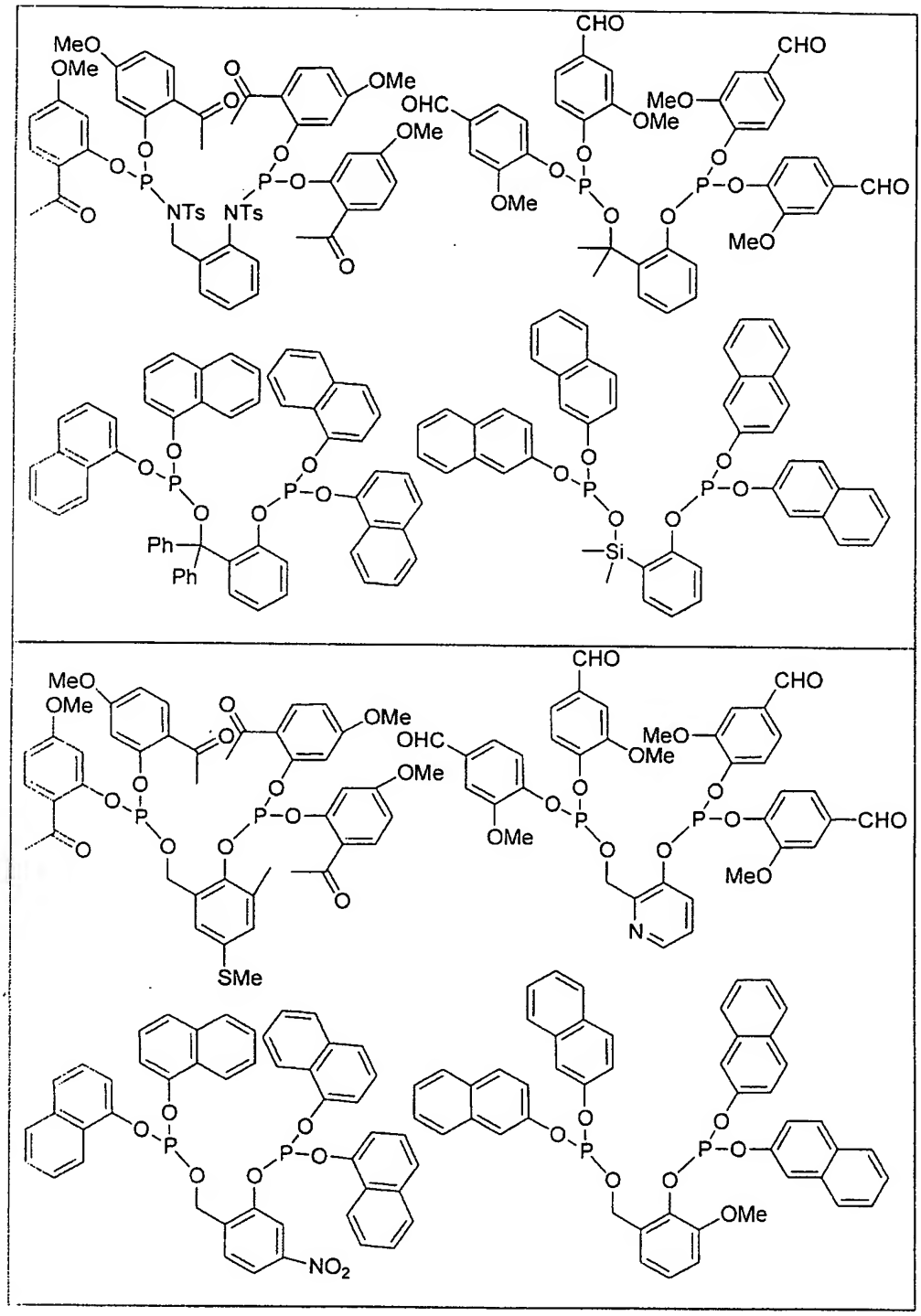
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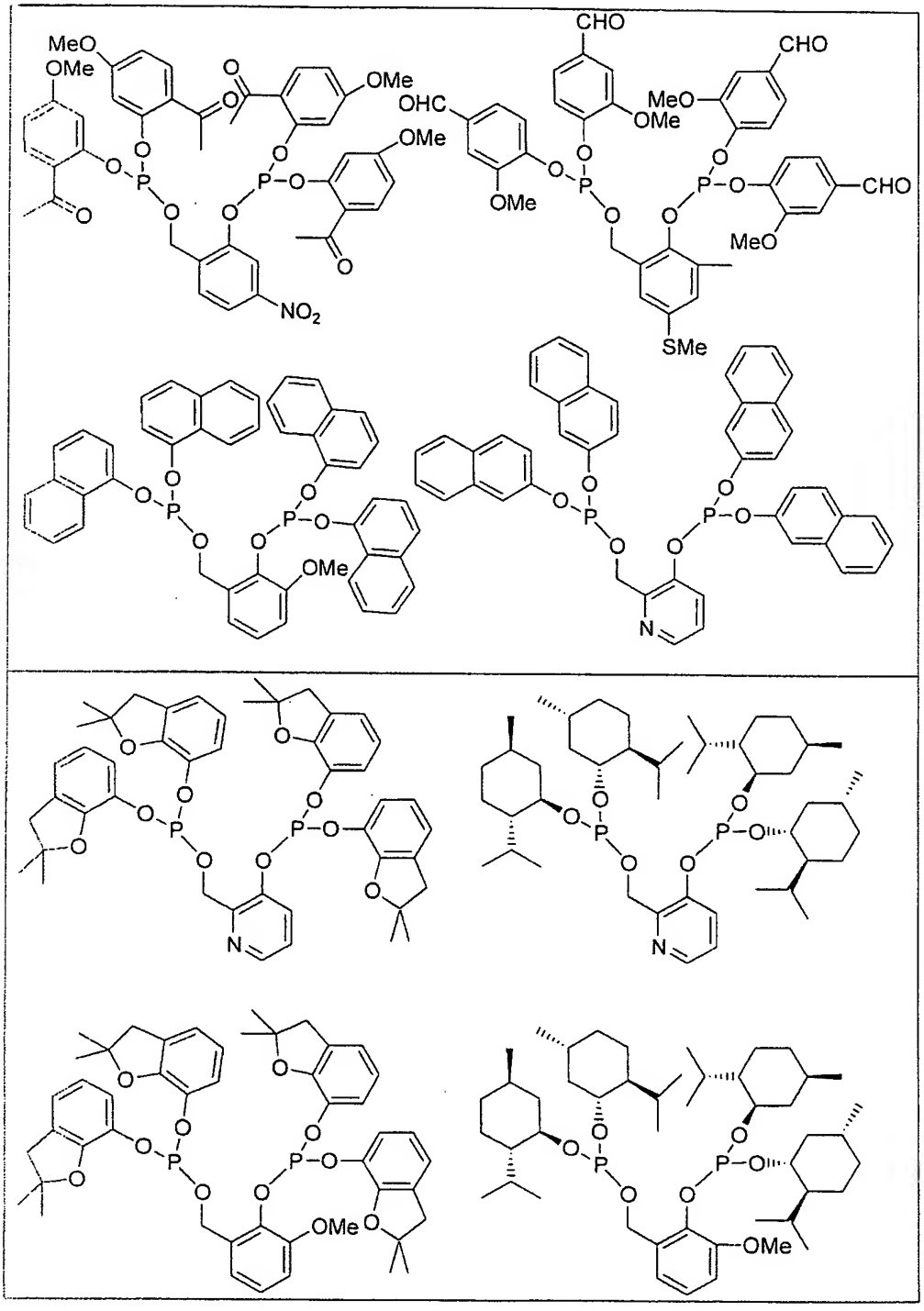
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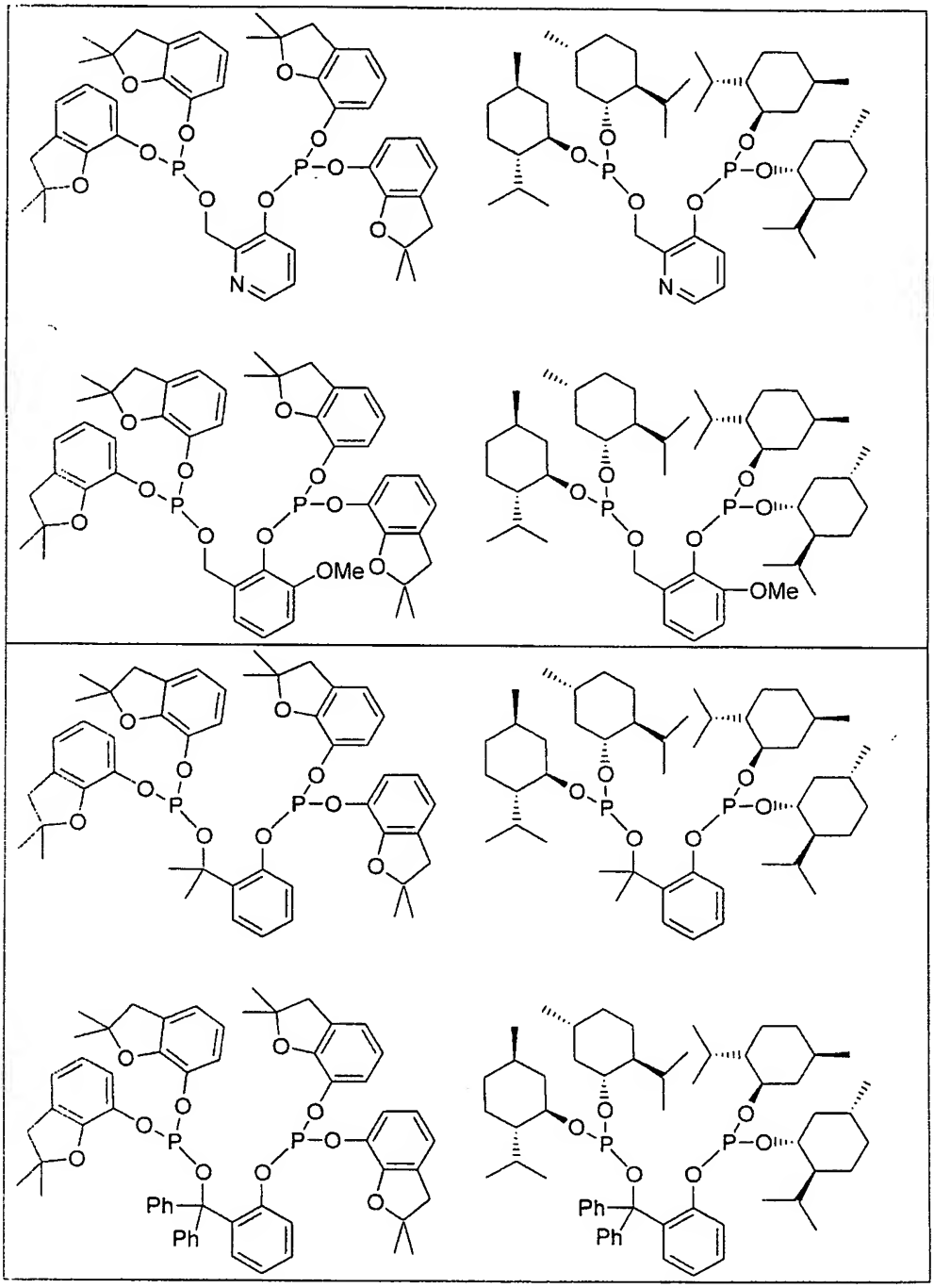
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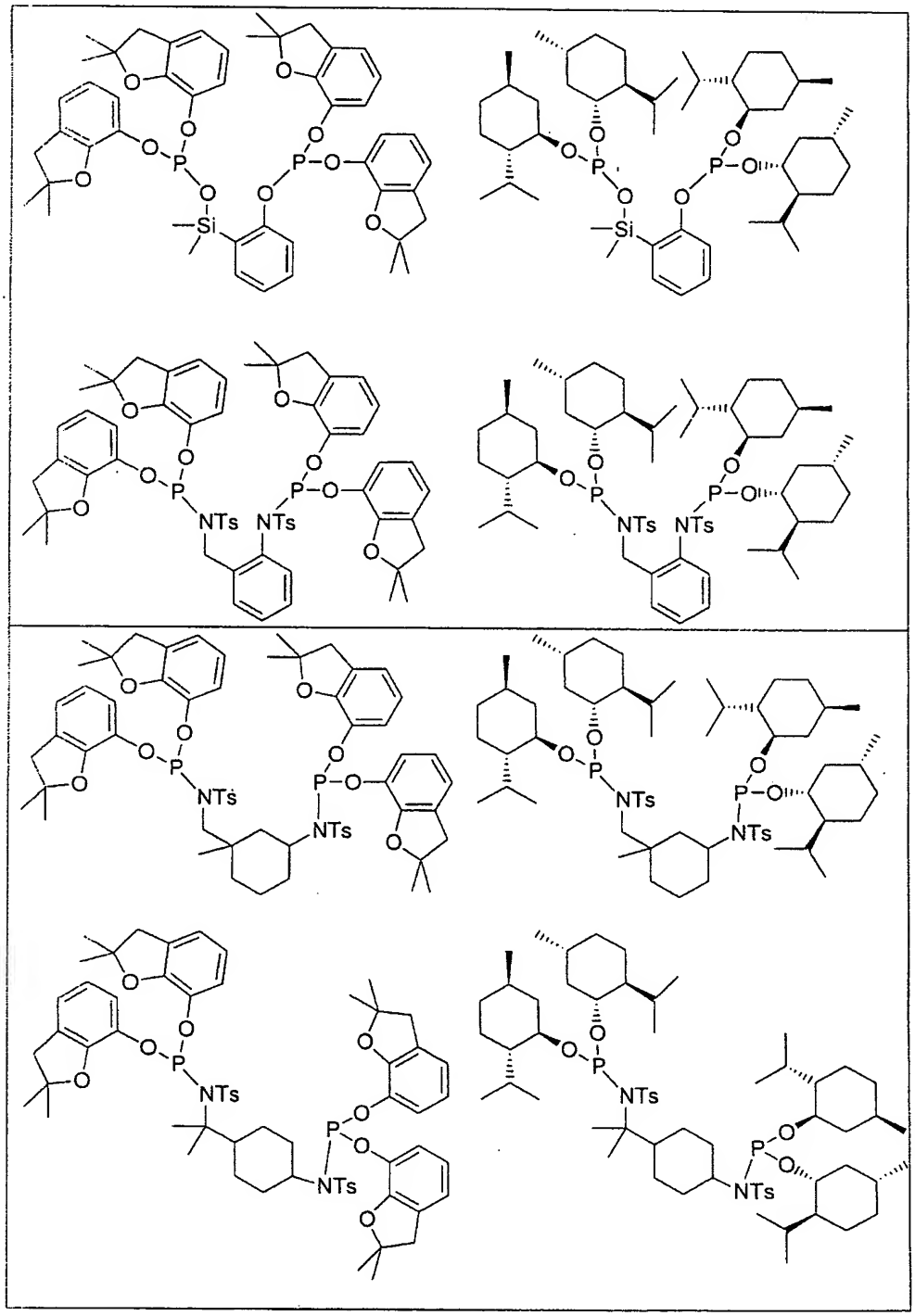
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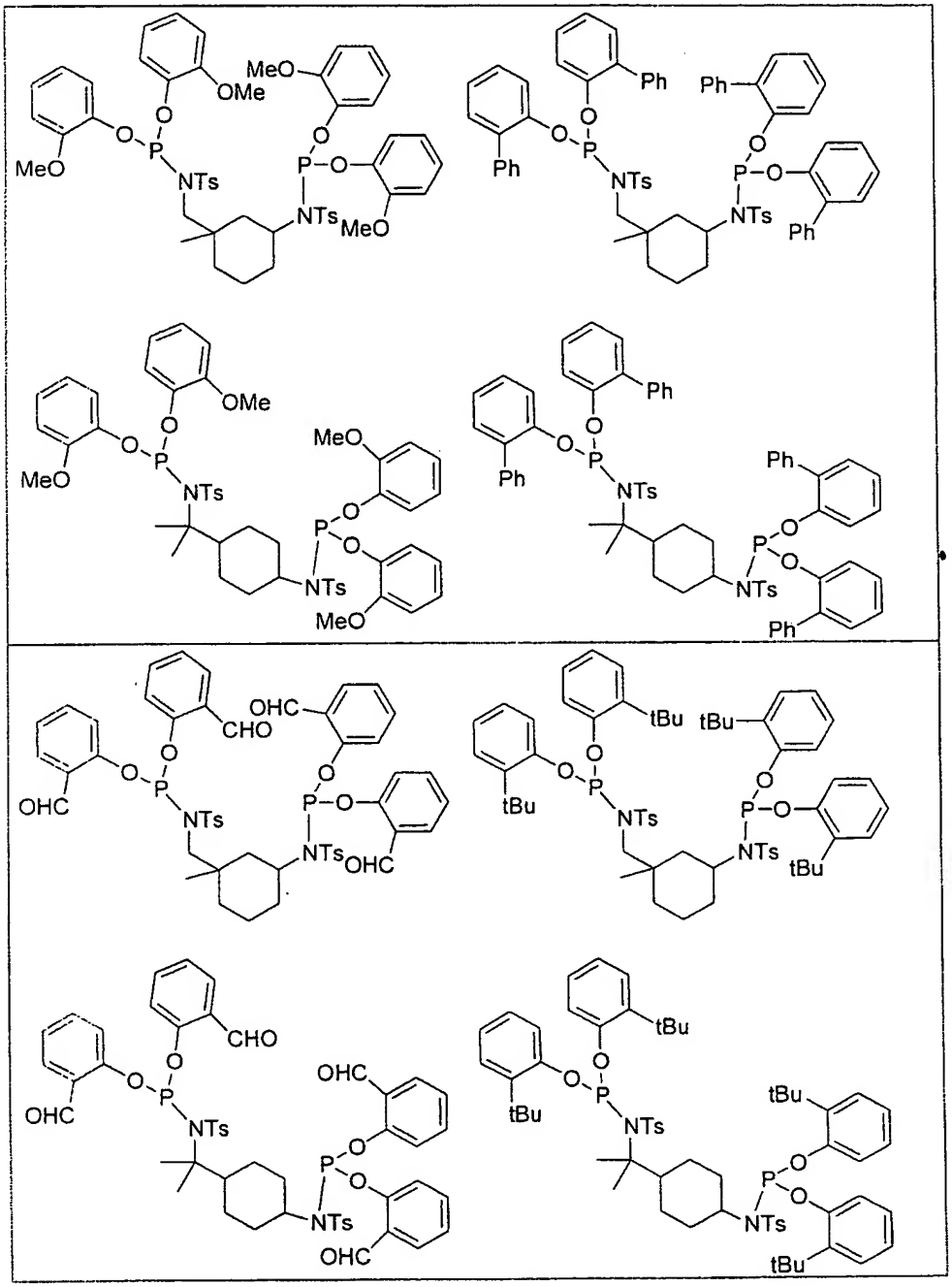
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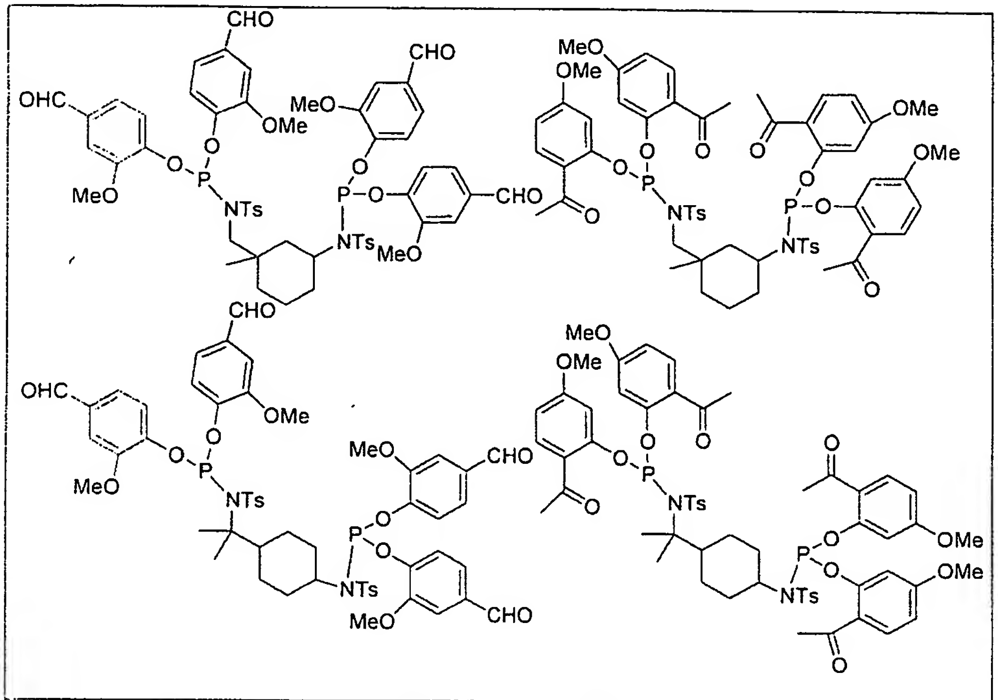

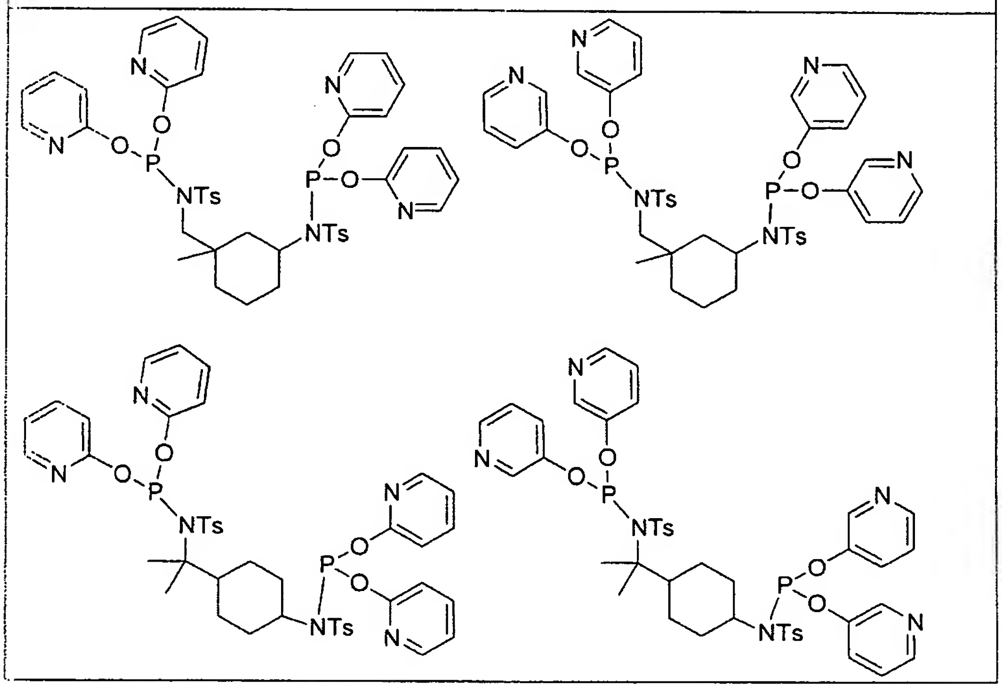

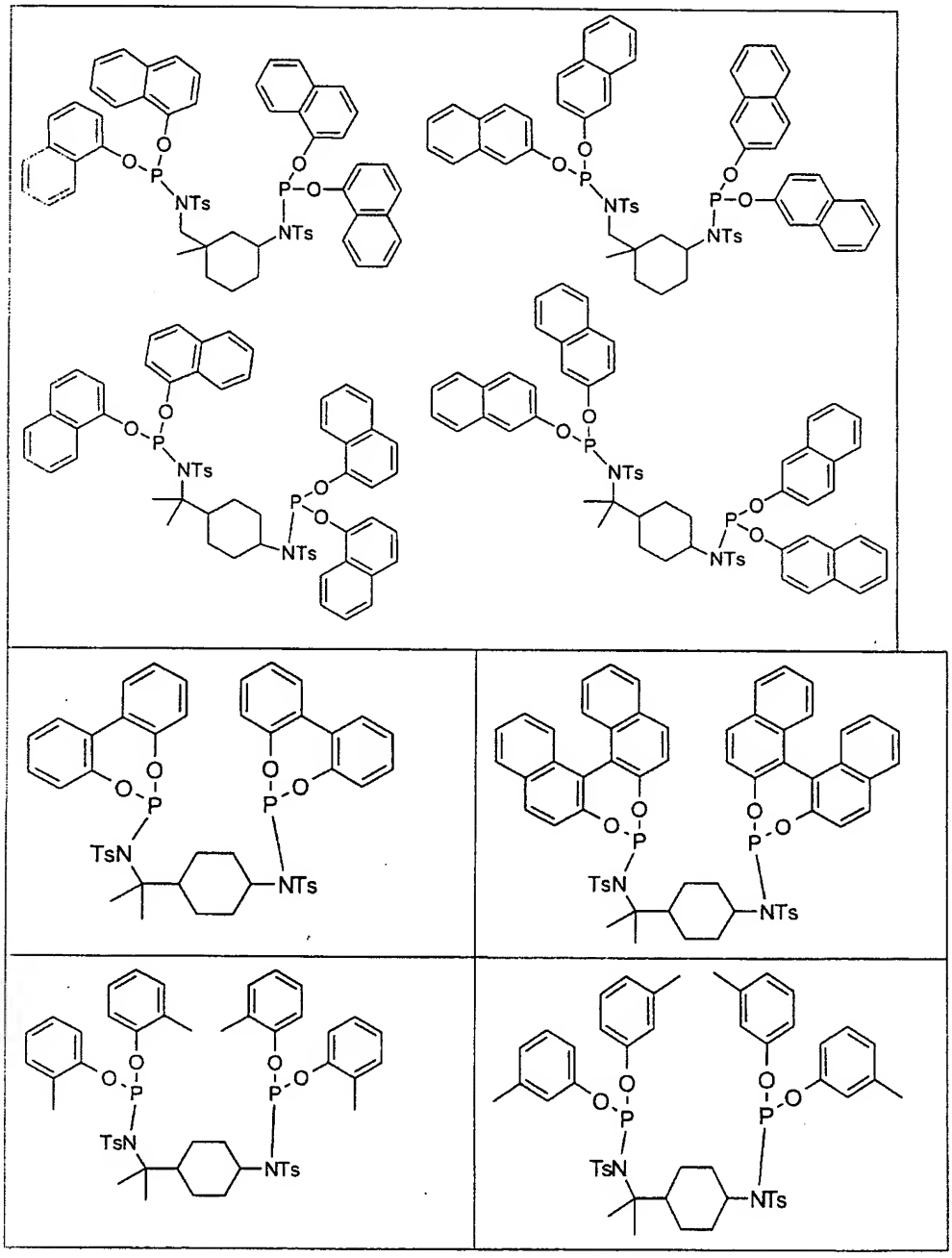
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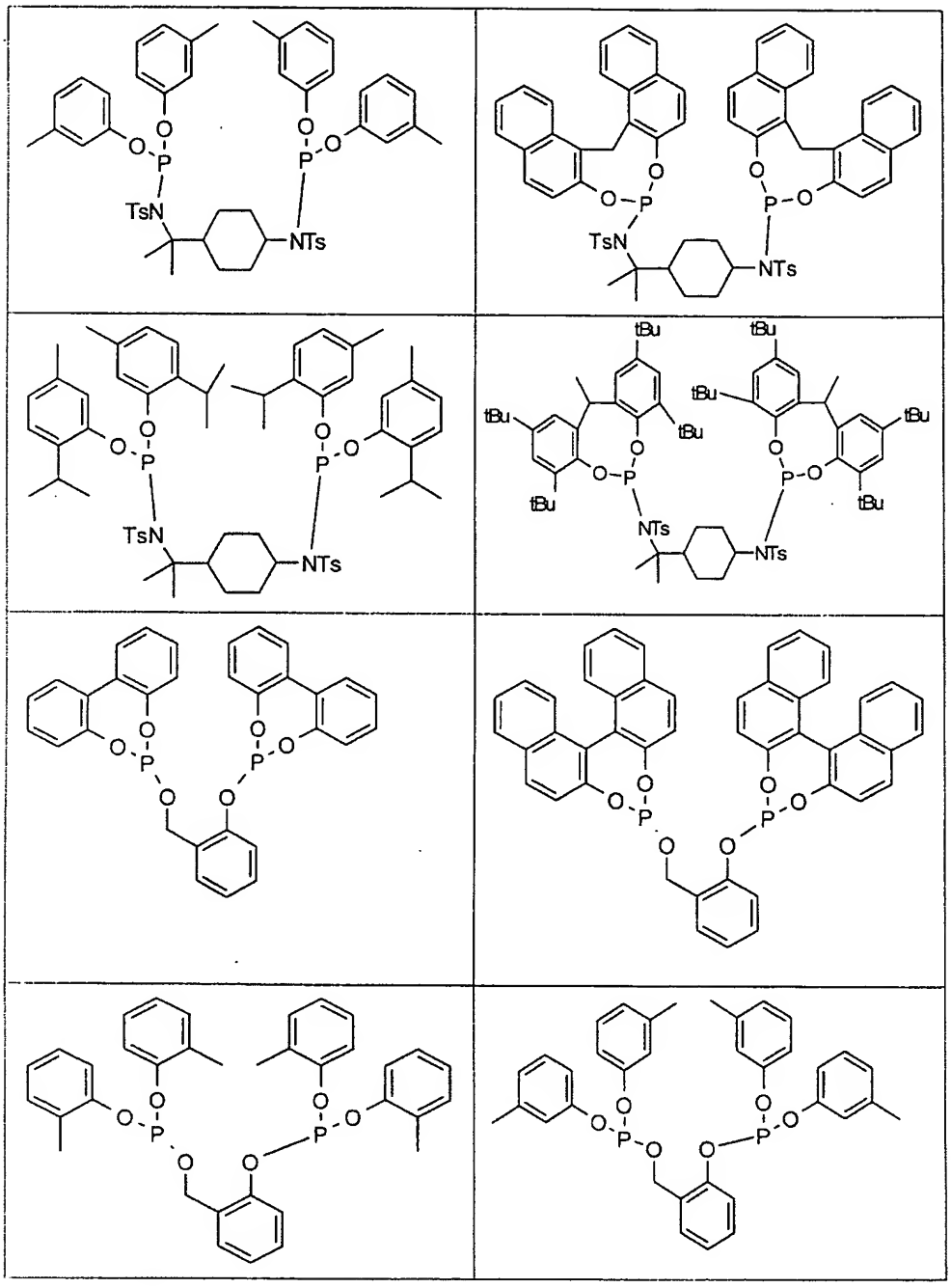
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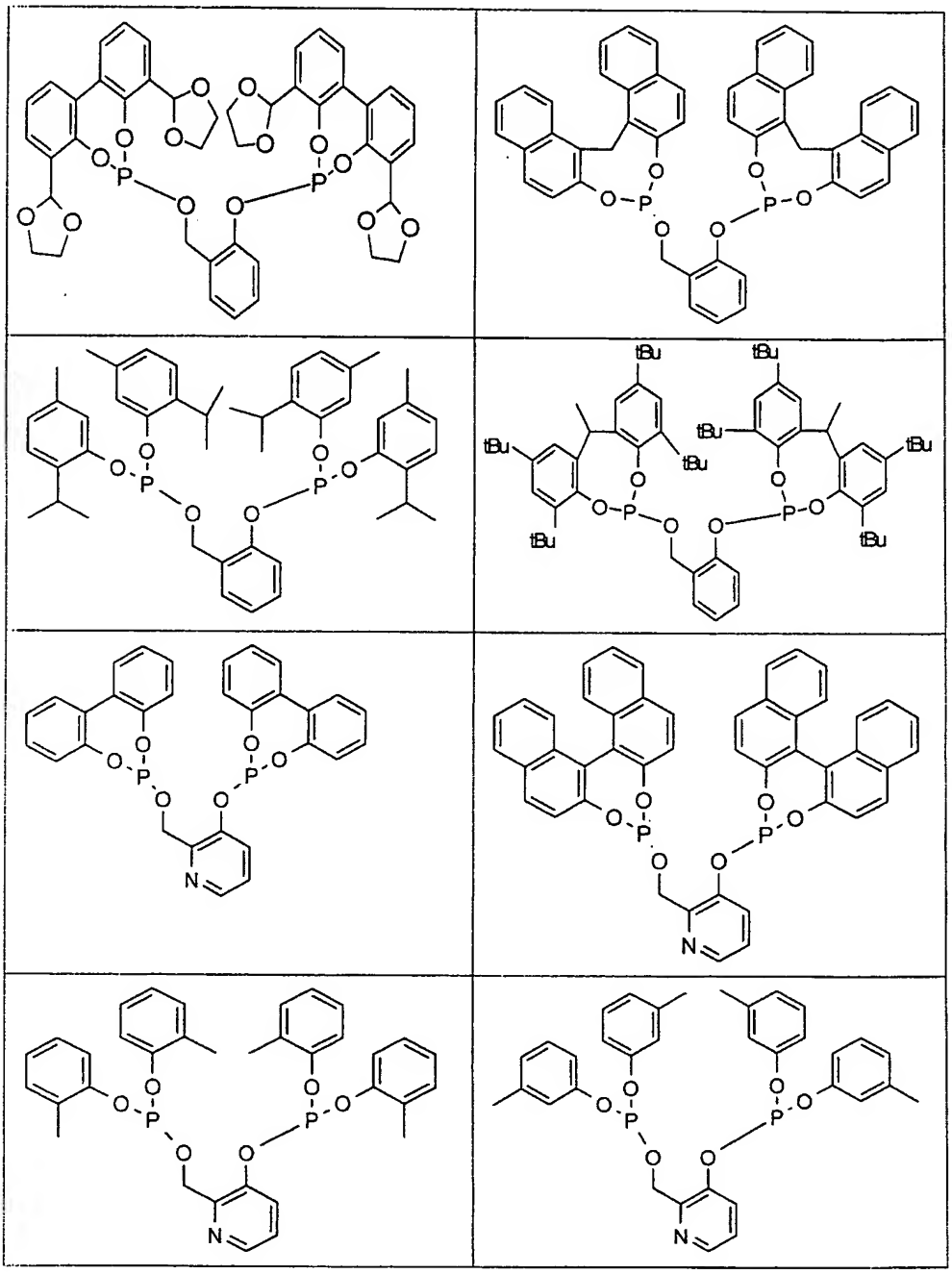

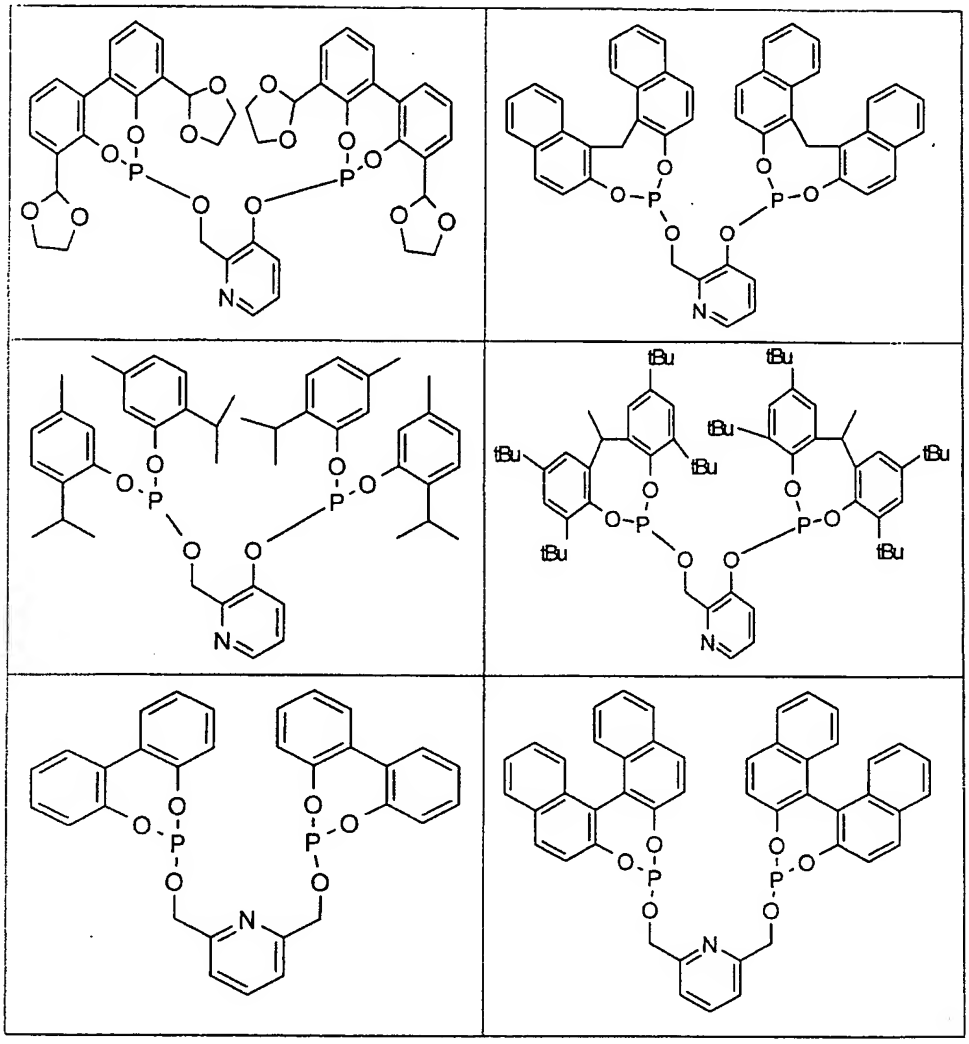

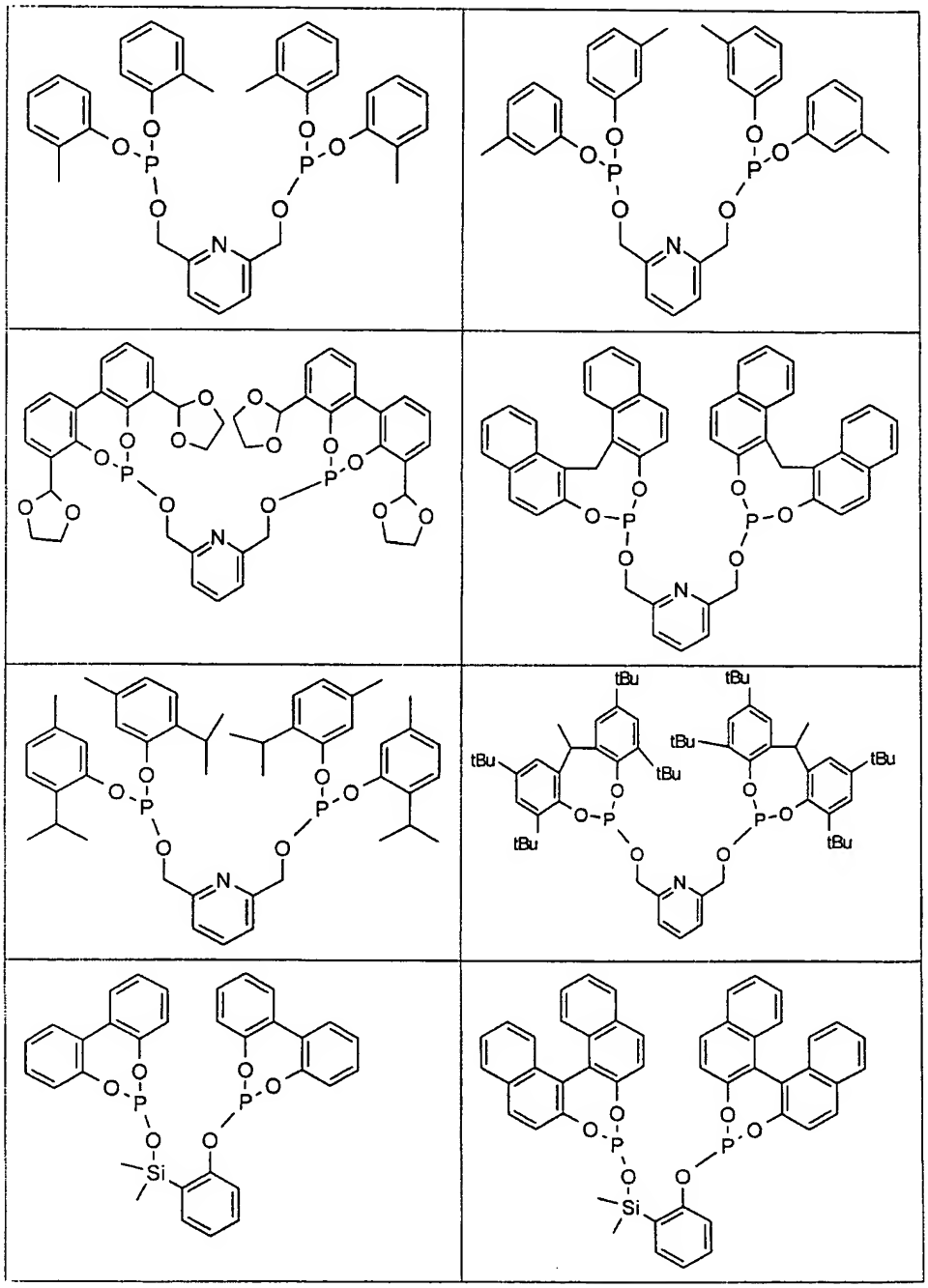

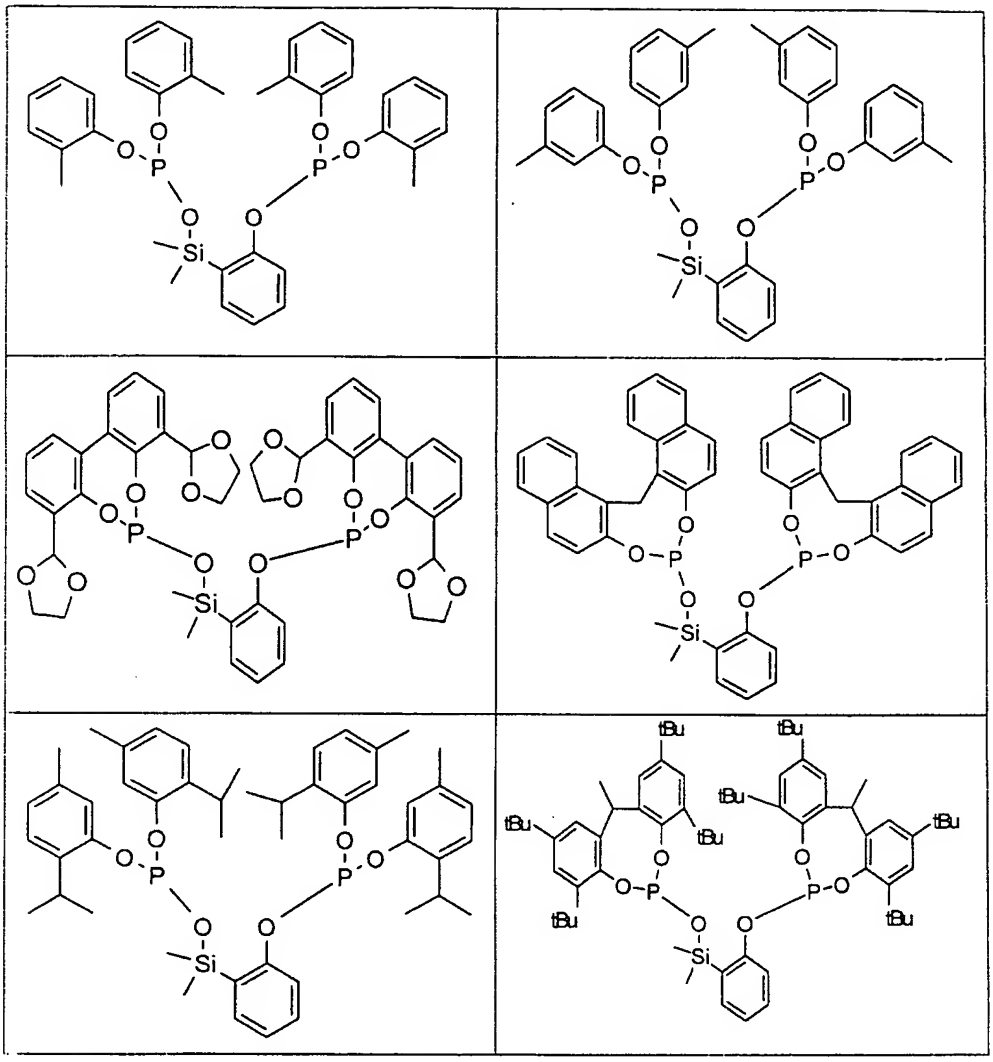

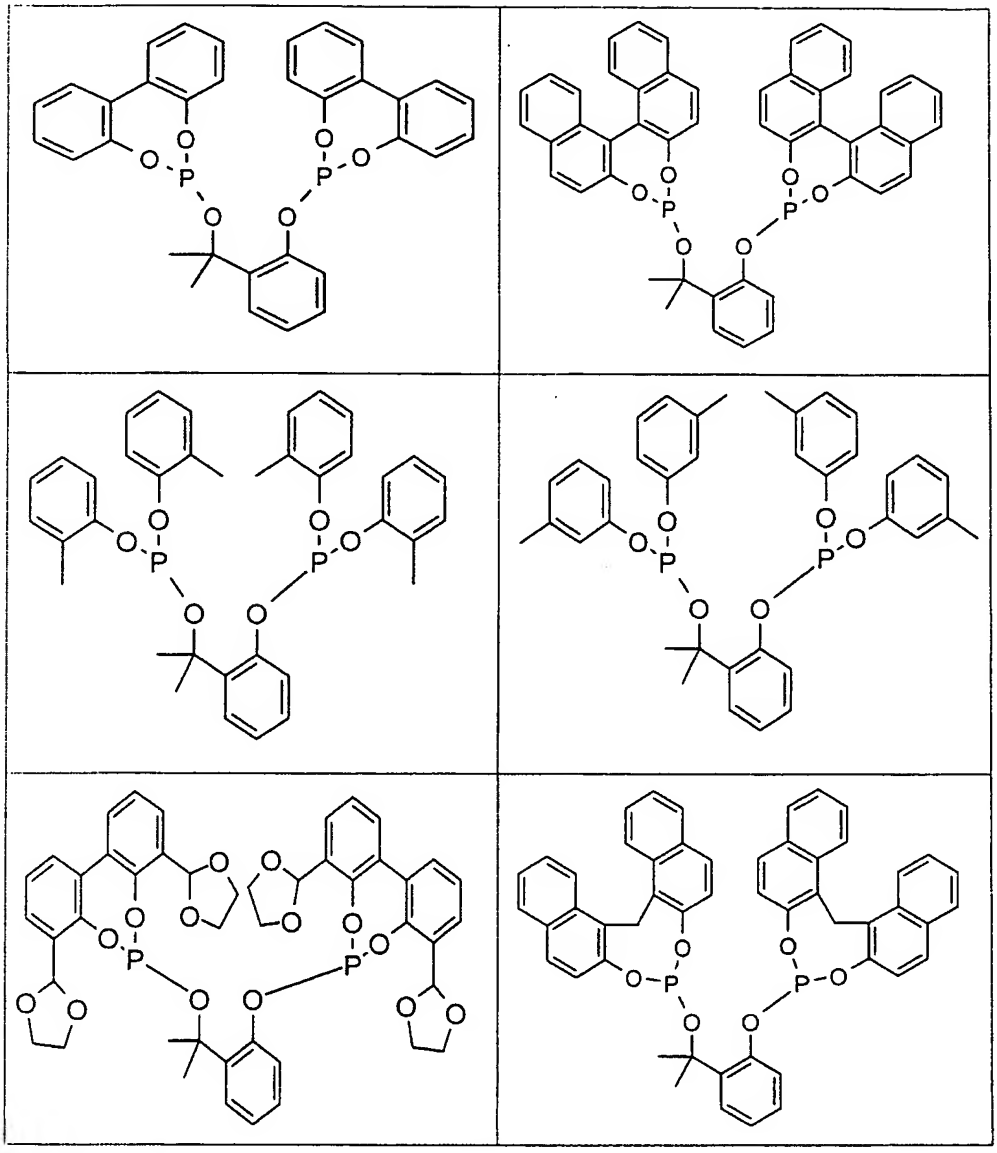

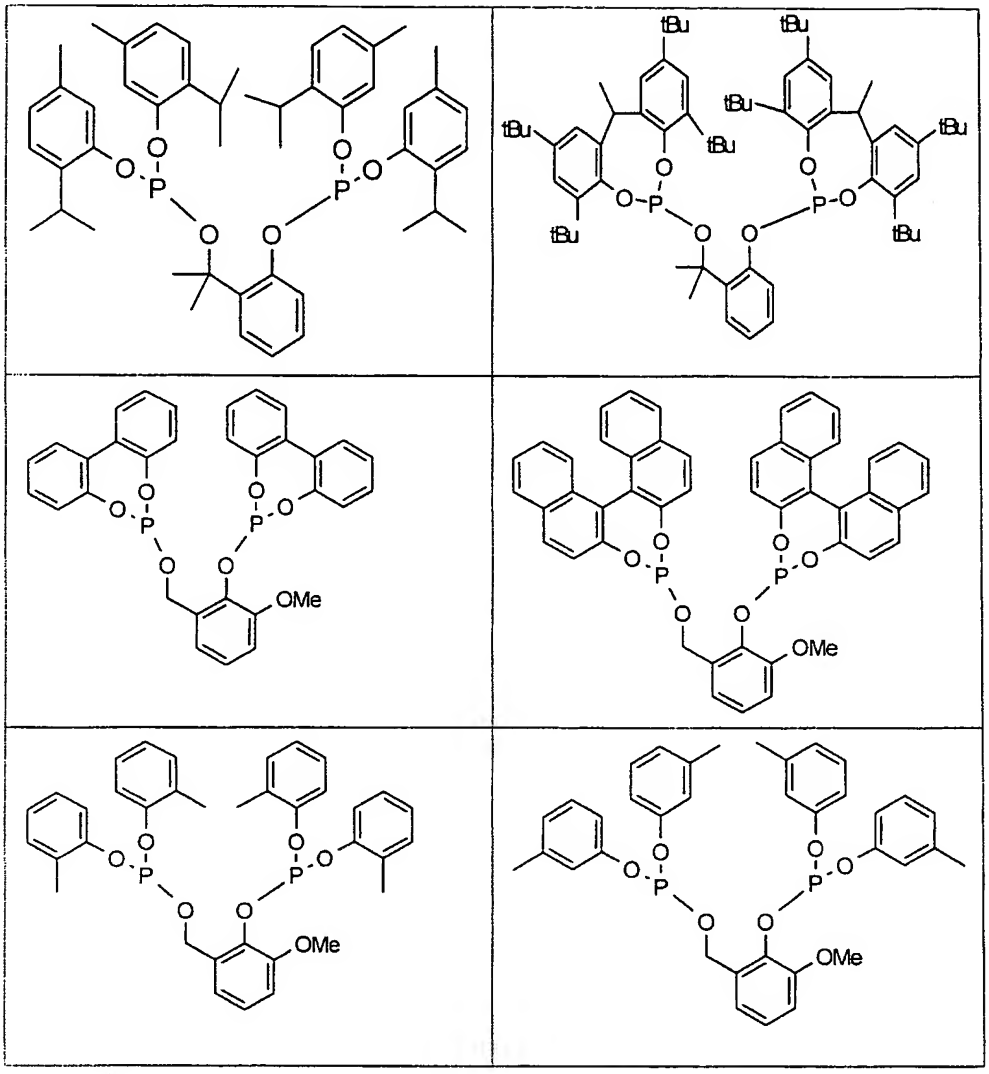
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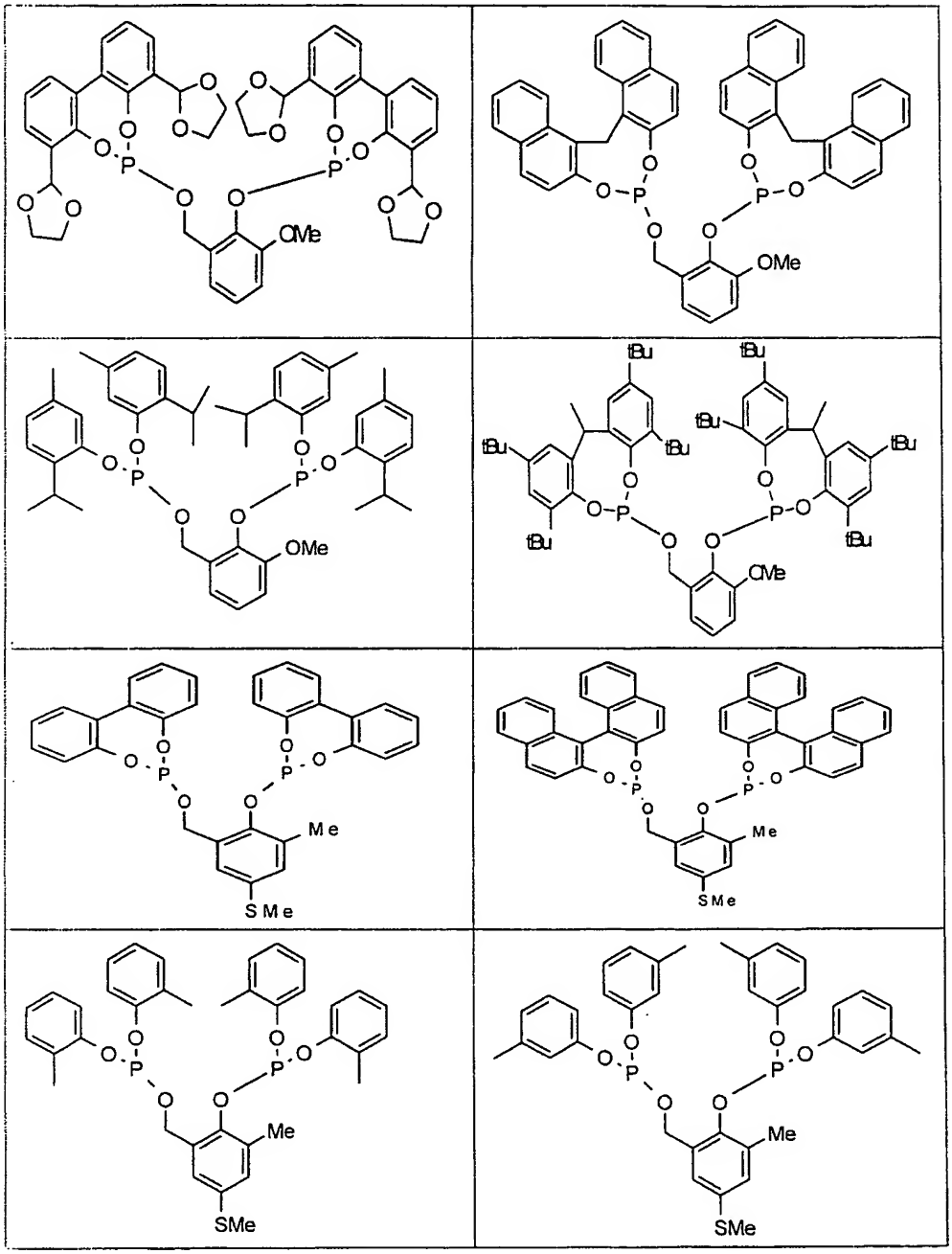
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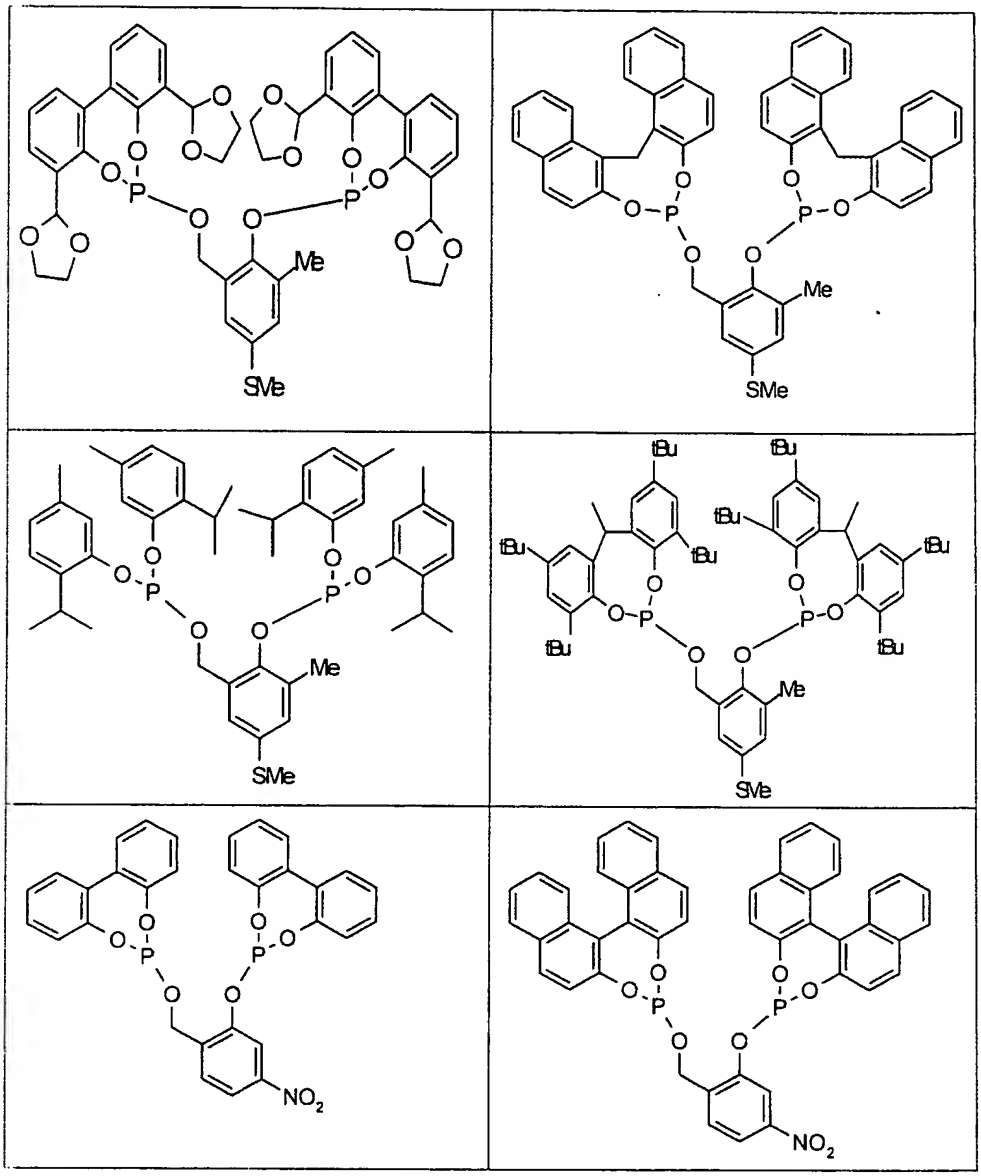
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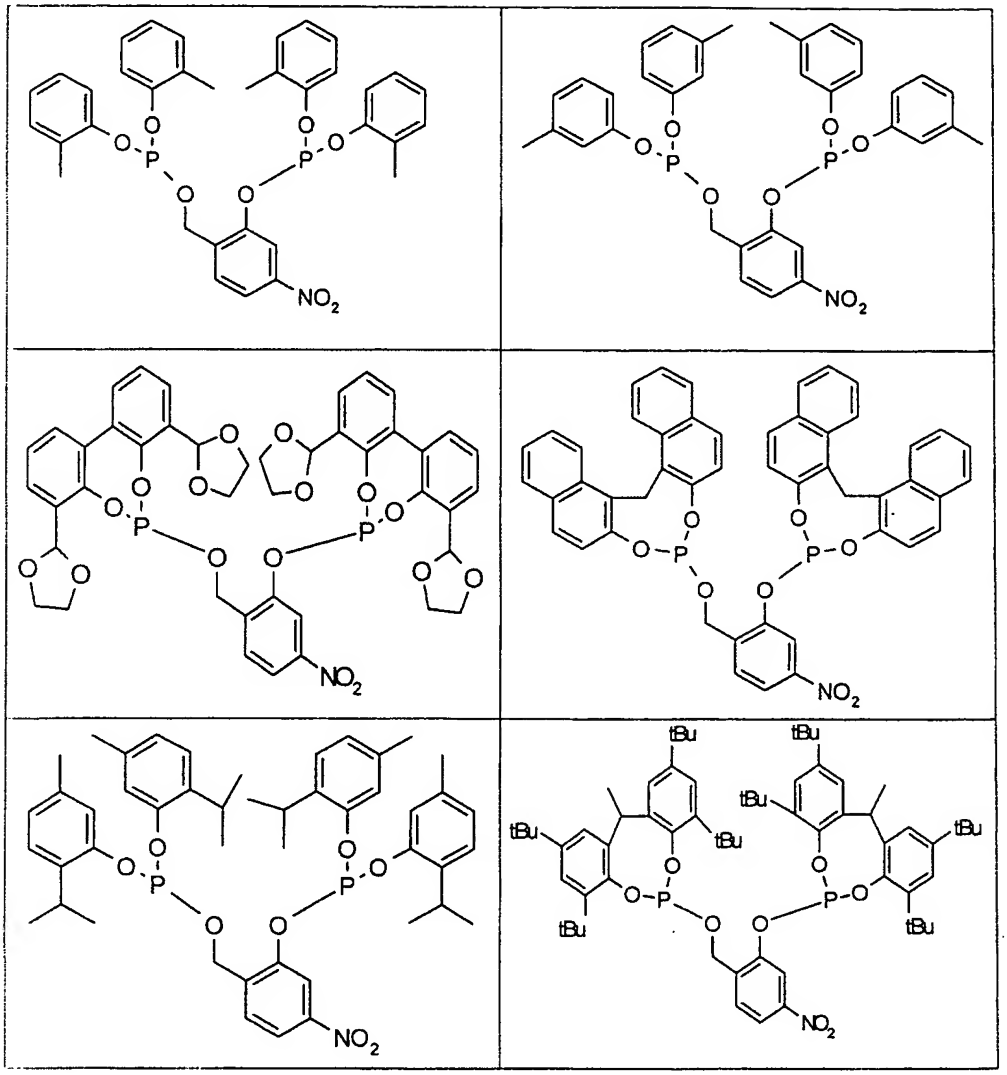

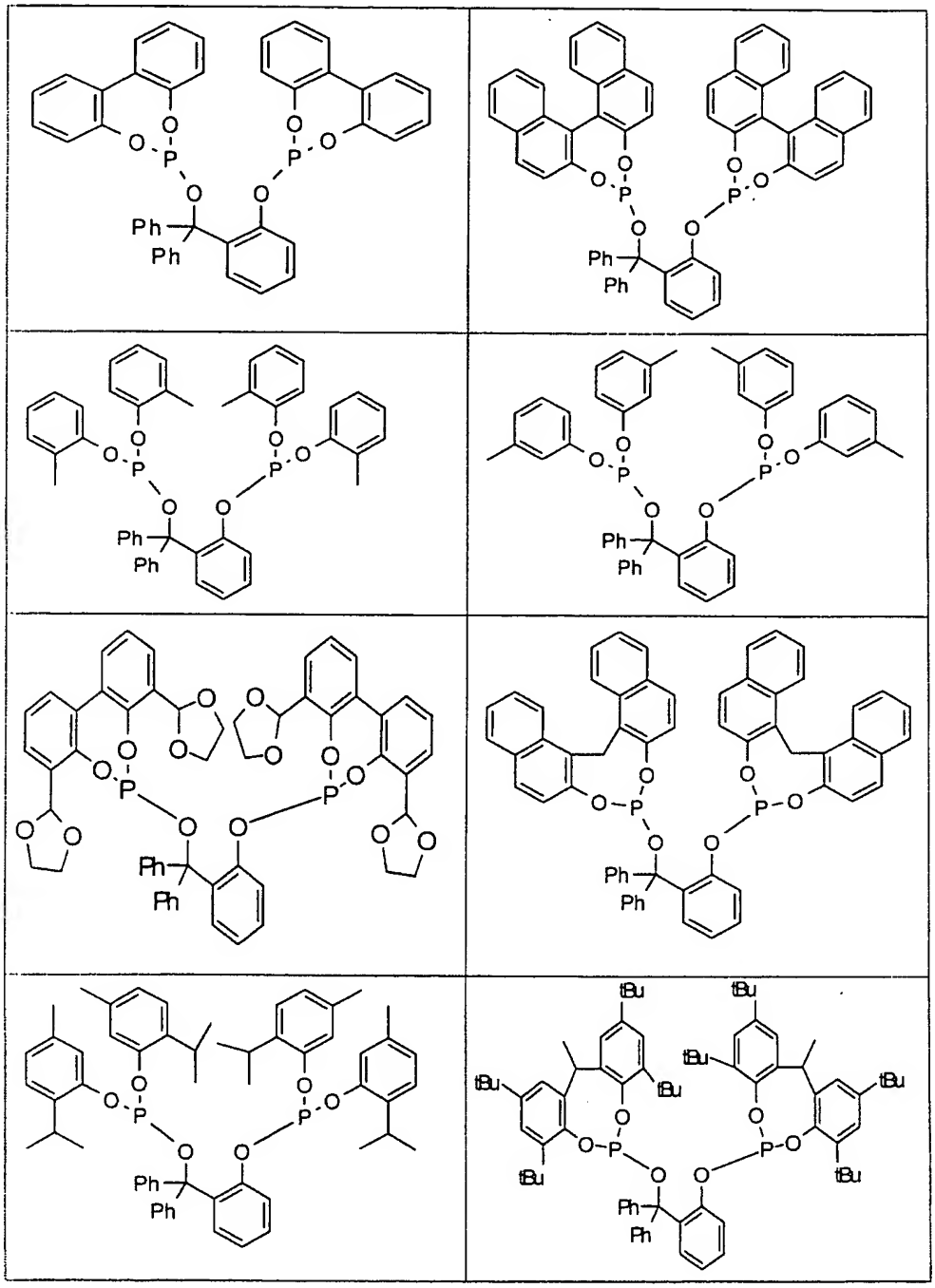

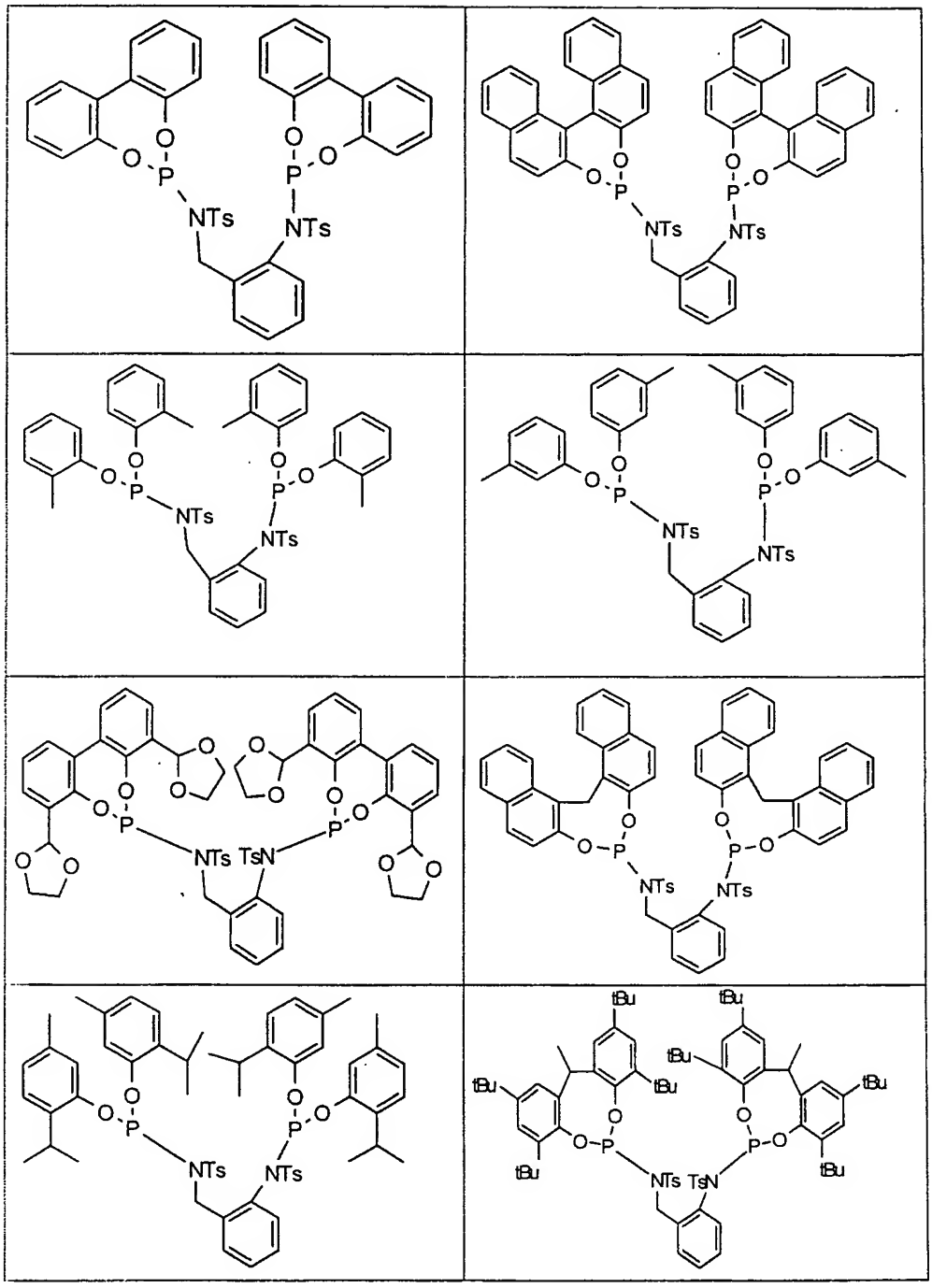
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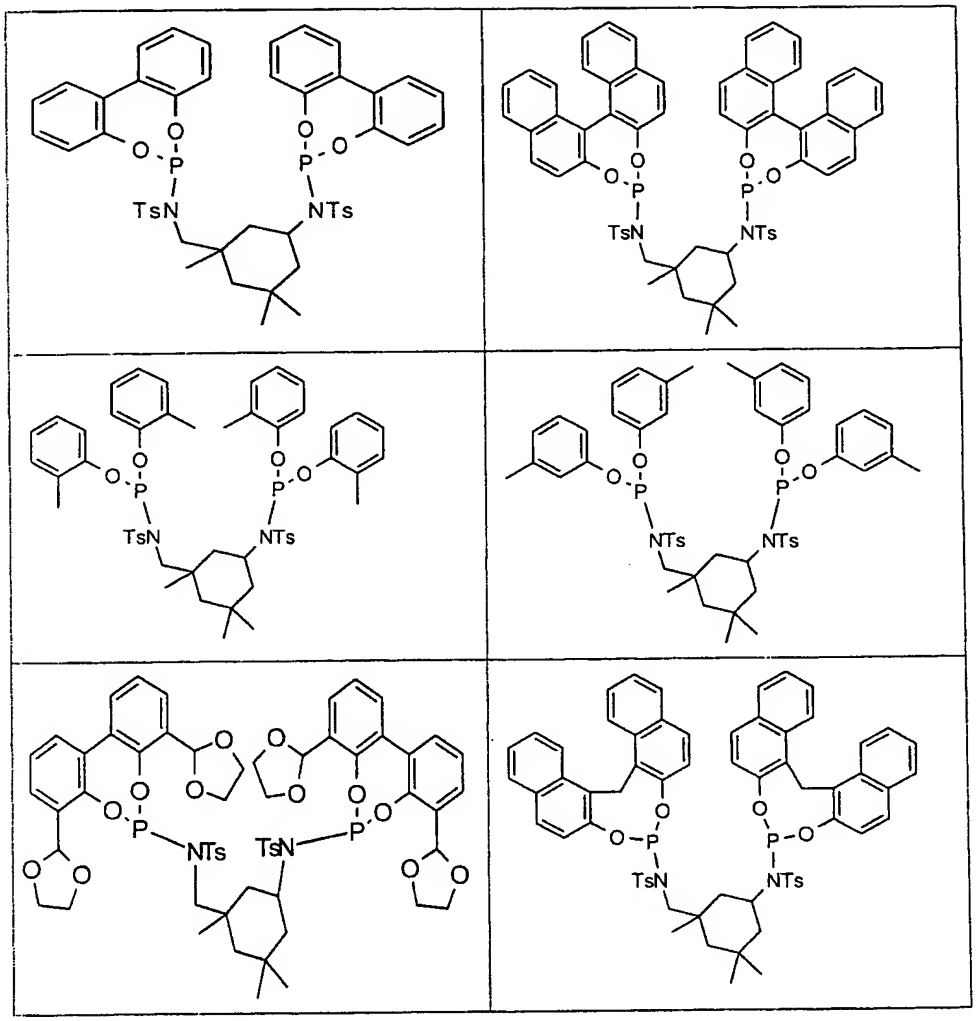
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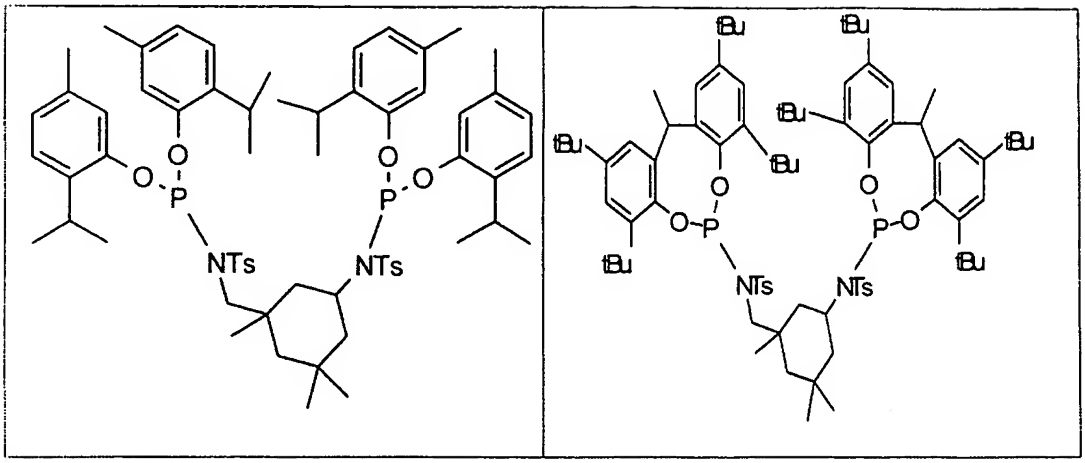


28. (New) The process according to Claim 25, wherein the metallic element is selected from the group consisting of nickel, cobalt, iron, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper, silver, gold, zinc, cadmium and mercury.

29. (New) The process according to Claim 25, wherein the reaction is carried out in a single-phase medium.

30. (New) The process according to Claim 25, wherein the catalyst corresponds to the general formula (V):

$$M[L_f]_v \qquad (V)$$

in which

M is a transition metal,

L_f represents the organic ligand of formula (I) and

v represents a number between 1 and 4 (inclusive).

31. (New) The process according to Claim 25, wherein the liquid medium further comprises a solvent for the catalyst which is miscible with a phase comprising the

compound to be hydrocyanated at the hydrocyanation temperature.

32. (New) The process according to Claim 25, wherein the transition metal compounds are nickel compounds in which nickel is in oxidation state zero, derivatives of nickel zero containing ligands, nickel carboxylates, carbonate, bicarbonate, borate, bromide, chloride, citrate, thiocyanate, cyanide, formate, hydroxide, hydrophosphite, phosphite, phosphate, iodide, nitrate, sulphate, sulphite, arylsulphonates or alkylsulphonates.

33. (New) The process according to Claim 25, wherein the hydrocarbon compound containing at least one ethylenic unsaturation is a diolefin, ethylenically unsaturated aliphatic nitrile, linear pentenenitrile, or monoolefin.

34. (New) The process according to Claim 25, wherein the transition metal is used in a amount of between 10^{-4} and 1 mol of transition metal per mole of hydrocarbon compound and wherein the organic ligand of formula (I) is used in a number of moles of from 0.5 to 50 relative to 1 mol of transition metal.

35. (New) The process according to Claim 25, wherein the hydrocyanation reaction is carried out at a temperature from 10°C to 200°C.

36. (New) The process according to claim 25 for hydrocyanating ethylenically unsaturated nitrile compounds to dinitriles, being operated in the presence of a catalyst system comprising at least one transition metal compound, at least one organic compound of formula (I) and a cocatalyst composed of at least one Lewis acid.

37. (New) The process according to Claim 36, wherein the ethylenically unsaturated nitrile compounds are pent-3-enenitrile, pent-4-enenitrile or mixtures

thereof.

38. (New) The process according to Claim 37, wherein the linear pentenenitriles contain amounts of other compounds selected from the group consisting of 2-methylbut-3-enenitrile, 2-methylbut-2-enenitrile, pent-2-enenitrile, valeronitrile, adiponitrile, 2-methylglutaronitrile, 2-ethylsuccinonitrile and butadiene.

39. (New) The process according to Claim 36, wherein the Lewis acid is selected from compounds of the elements of groups Ib, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIb, VIIb and VIII of the Periodic Table of the Elements.

40. (New) The process according to Claim 36, wherein the Lewis acid is selected from salts selected from the group of halides, sulphates, sulphonates, haloalkylsulphonates, perhaloalkylsulphonates, haloalkylacetates, perhaloalkylacetates, carboxylates and phosphates.

41. (New) The process according to Claim 36, wherein the Lewis acid is zinc chloride, zinc bromide, zinc iodide, manganese chloride, manganese bromide, cadmium chloride, cadmium bromide, stannous chloride, stannous bromide, stannous sulphate, stannous tartrate, indium trifluoromethylsulphonate, indium trifluoroacetate, zinc trifluoroacetate, lanthanum chloride, cerium chloride, praseodymium chloride, neodymium chloride, samarium chloride, europium chloride, gadolinium chloride, terbium chloride, dysprosium chloride, hafnium chloride, erbium chloride, thallium chloride, ytterbium chloride, lutetium chloride, lanthanum bromide, cerium bromide, praseodymium bromide, neodymium bromide, samarium bromide, europium bromide, gadolinium bromide, terbium bromide, dysprosium bromide, hafnium bromide, erbium

bromide, thallium bromide, ytterbium bromide, lutetium bromide, cobalt chloride, ferrous chloride, or yttrium chloride.

42. (New) The process according to Claim 36, wherein the Lewis acid employed represents from 0.01 to 50 mol per mole of transition metal compound.

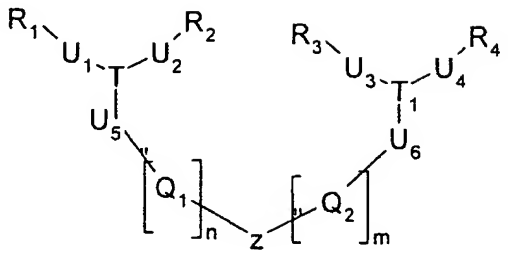
43. (New) The process according to Claim 25, wherein 2-methylbut-3-enenitrile, present in the reaction mixture originating from butadiene hydrocyanation, is isomerized to pentenenitriles in the absence of hydrogen cyanide, in the presence of a catalyst comprising at least one organic ligand of general formula (I) or (V) and at least one transition metal compound.

44. (New) The process according to Claim 43, wherein the 2-methylbut-3-enenitrile subjected to isomerization is employed alone or in a mixture with 2-methylbut-2-enenitrile, pent-4-enenitrile, pent-3-enenitrile, pent-2-enenitrile, butadiene, adiponitrile, 2-methylglutaronitrile, 2-ethylsuccinonitrile or valeronitrile.

45. (New) The process according to Claim 44, wherein the isomerization reaction is carried out at a temperature from 10°C to 200°C.

46. (New) The process according to Claim 43, wherein the isomerization of 2-methylbut-3-enenitrile to pentenenitriles is carried out in the presence of at least one transition metal compound, at least one organic phosphorous ligand of the formula (I) and a cocatalyst composed of at least one Lewis acid.

47. (New) Organophosphorus compounds corresponding to the general formula (I) below:



(I)

in which:

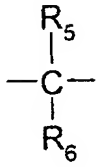
T and T_1, which are identical or different, represent a phosphorus, arsenic or antimony atom,

U_1, U_2, U_3, U_4, U_5, and U_6, which are identical or different, represent an oxygen atom or a radical NR, R representing an alkyl, aryl, sulphonyl or carbonyl radical,

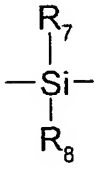
R_1, R_2, R_3 and R_4, which are identical or different, represent a substituted or unsubstituted, aromatic, aliphatic or cycloaliphatic radical comprising one or more rings, which are in fused form or not and which may contain one or more heteroatoms, where the radicals R_1 and R_2 on the one hand and R_3 and R_4 on the other hand are optionally interconnected by a covalent bond, a hydrocarbon chain or a heteroatom, and, when one of the radicals U_1, U_2, U_3 and U_4 includes an N atom, the associated radical R_1, R_2, R_3 or R_4 optionally form a ring including the N element of said radical,

m and n are identical or different integers between 0 and 6, where m + n must be greater than or equal to 1,

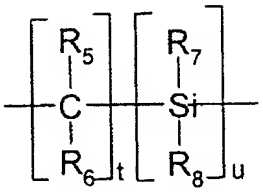
Q_1 and Q_2, which are identical or different, represent a group corresponding to the general formulae II, III or IV below:



(II)



(III)



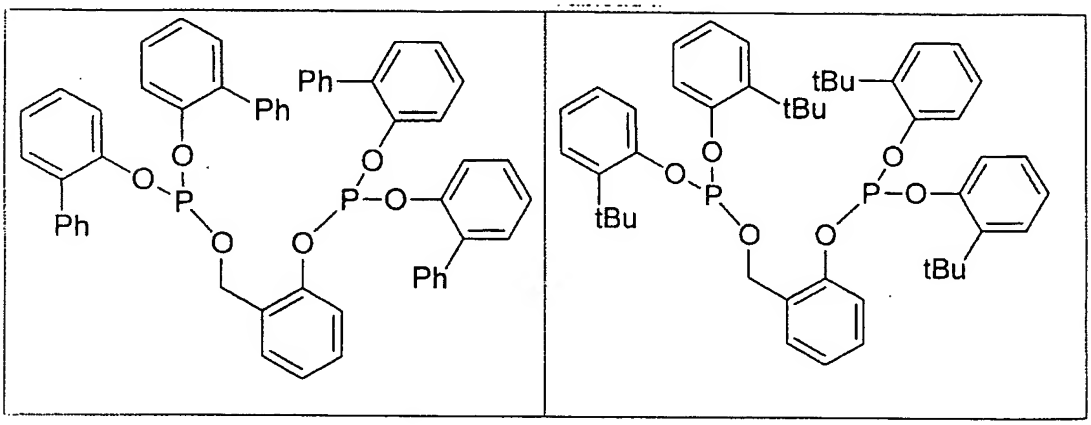
(IV)

in which R_5, R_6, R_7 and R_8, which are identical or different, represent aliphatic, cycloaliphatic or aromatic hydrocarbon radicals containing 1 to 12 carbon atoms, R_5 and R_6 also representing the hydrogen atom, and

t and u represent integers between 0 and 6, with a sum u + t greater than or equal to 1,

Z representing a divalent radical selected from the group consisting of aromatic or cycloaliphatic radicals containing one or more rings, which are in fused form or not and which may be substituted and may contain heteroatoms.

48. (New) Organophosphorus compounds corresponding to the formulae below: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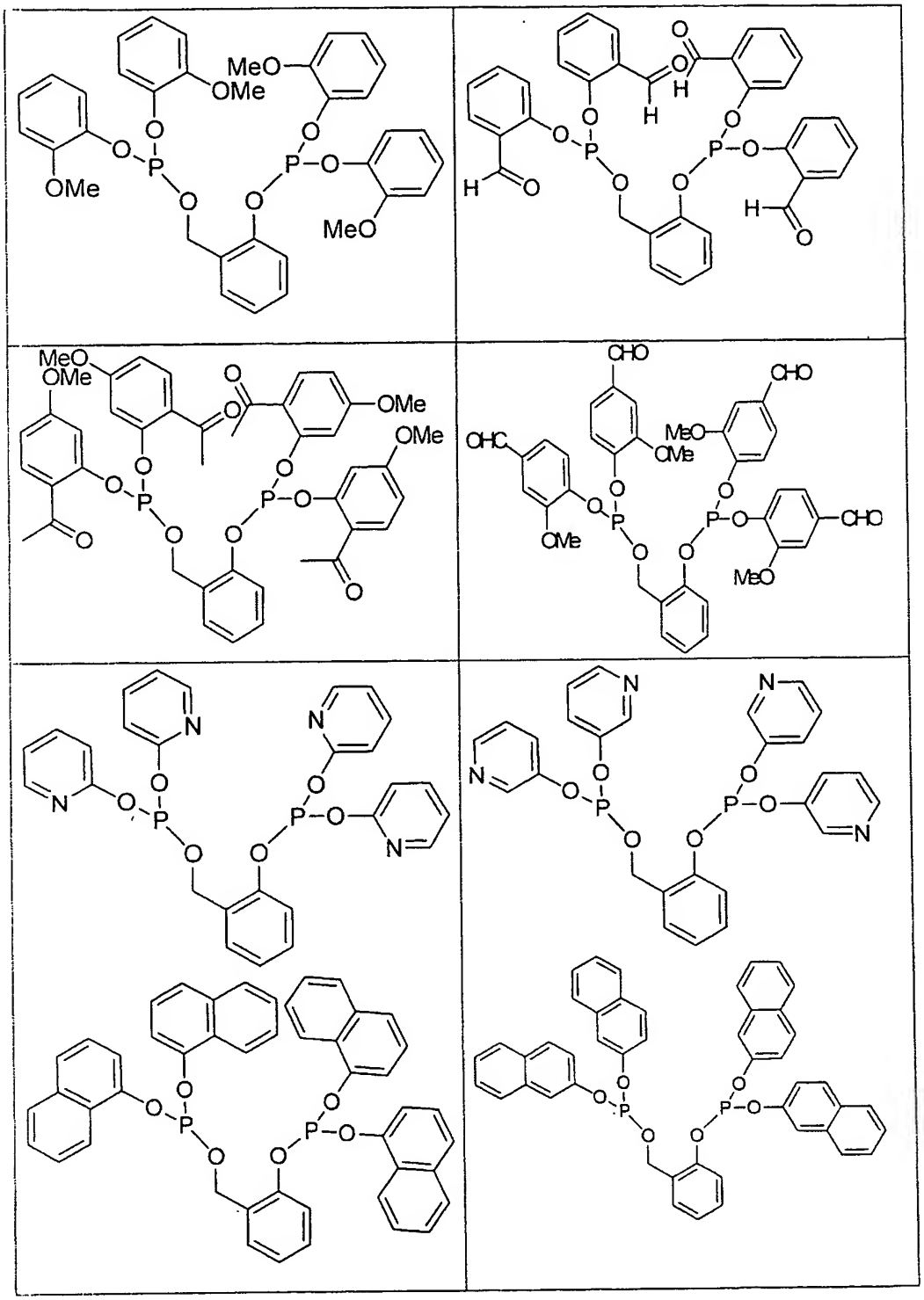
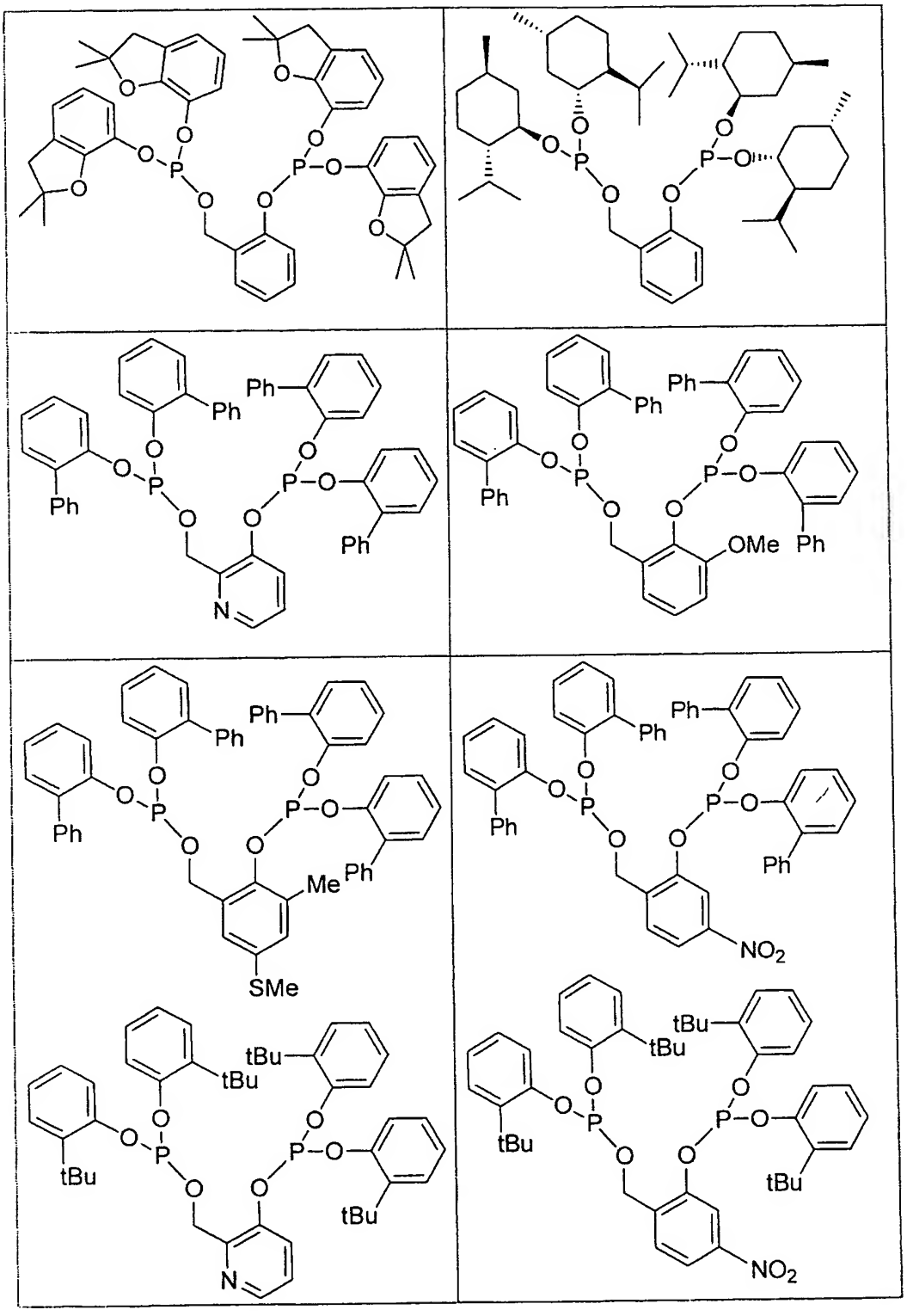
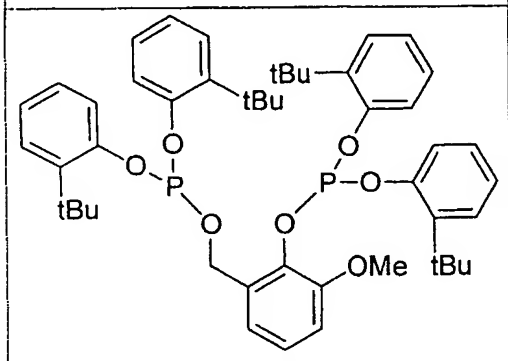
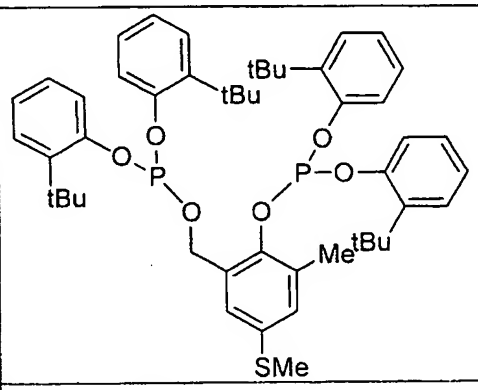
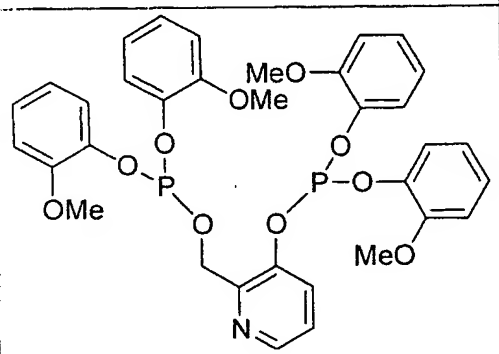
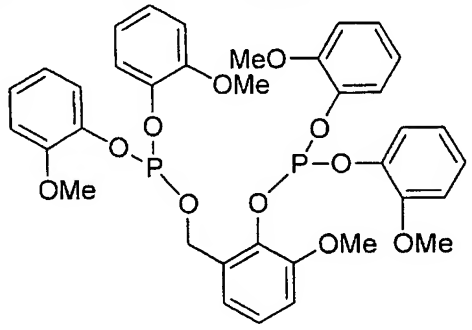
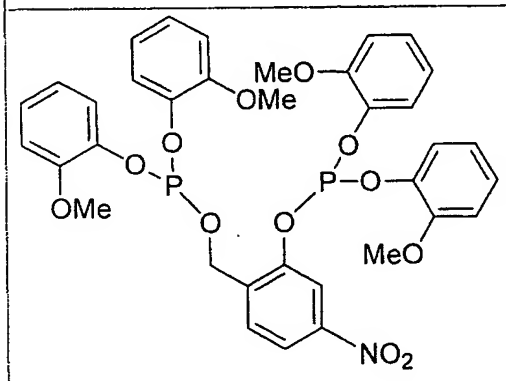
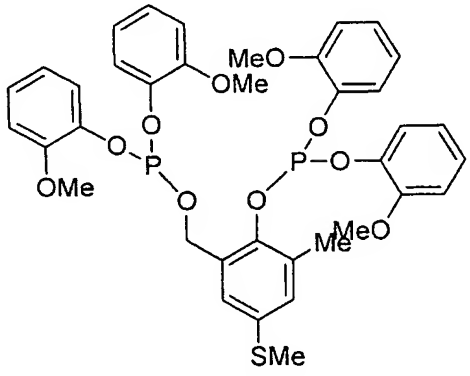
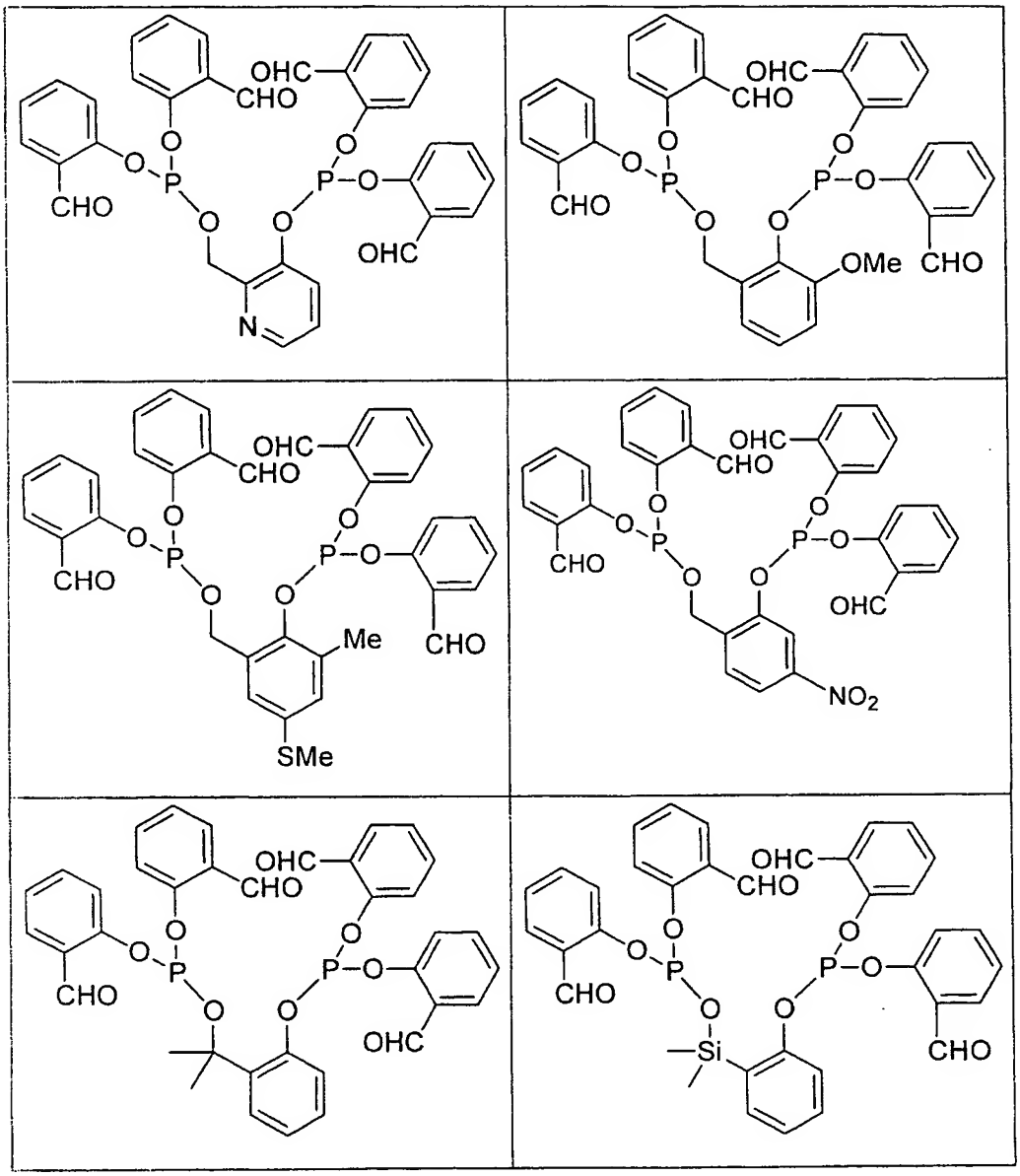
Ph
Ph
Ph
O
O
O
O
O
O
P
P
tBu
tBu
tBu
tBu




Ph
Ph
Ph
Ph
N
OMe
Me
SMe
tBu
NO2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CHO
CHO
O
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P
O
P
O
O
O
OHC
N
OHC
CHO
CHO
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O
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P
O
O
OMe
CHO
OHC
CHO
CHO
O
O
P
O
P
O
O
Me
CHO
SMe
OHC
CHO
CHO
O
O
P
O
P
O
O
OHC
NO2
OHC
CHO
CHO
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OHC
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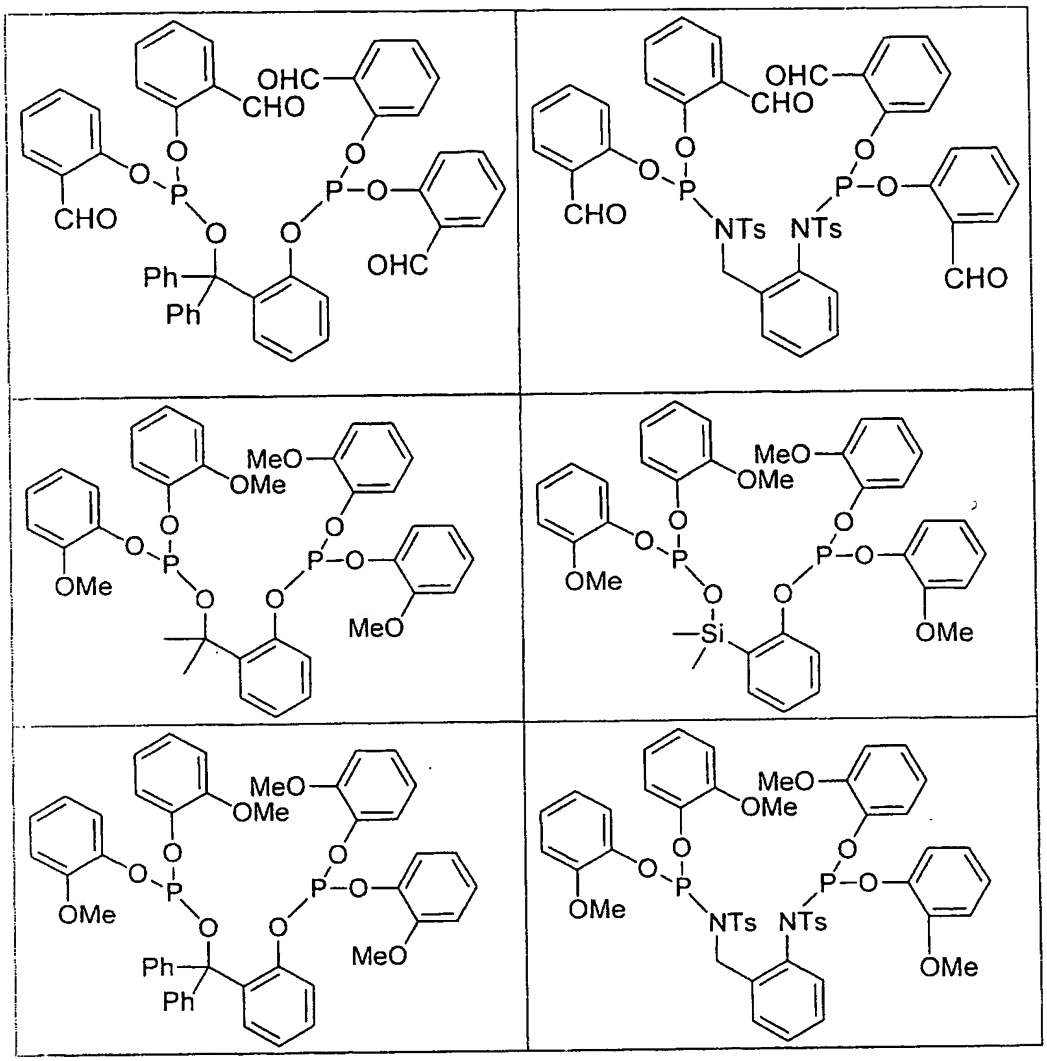
P
O
O
Si
CHO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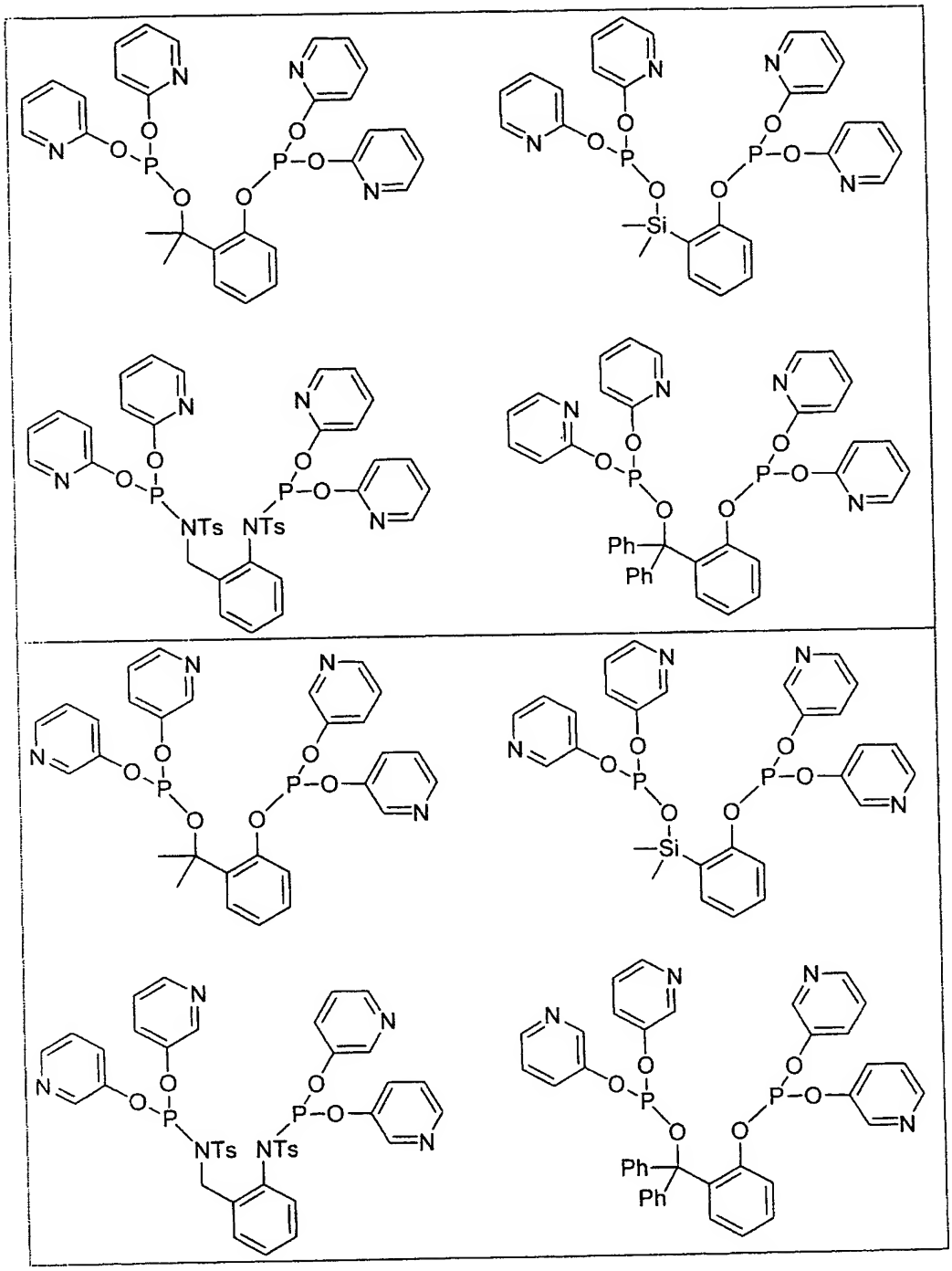
CHO
CHO
OHC
Ph
Ph
OHC
CHO
CHO
NTs
NTs
CHO
MeO
OMe
OMe
MeO
MeO
OMe
OMe
—Si
OMe
MeO
OMe
OMe
Ph
Ph
MeO
MeO
OMe
OMe
NTs
NTs
OMe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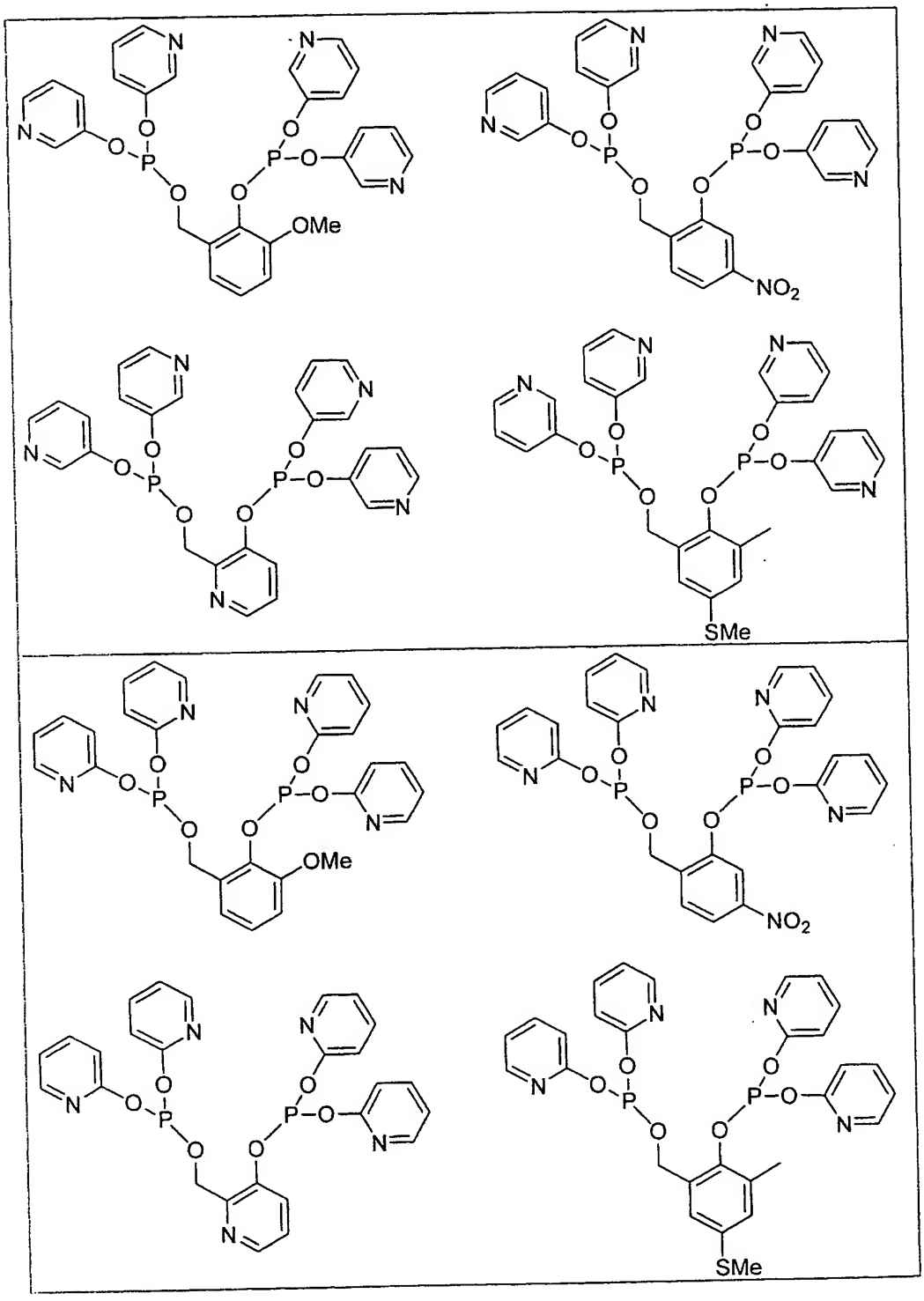
Ph
Si
NTs
NTs
Ph
Ph
Si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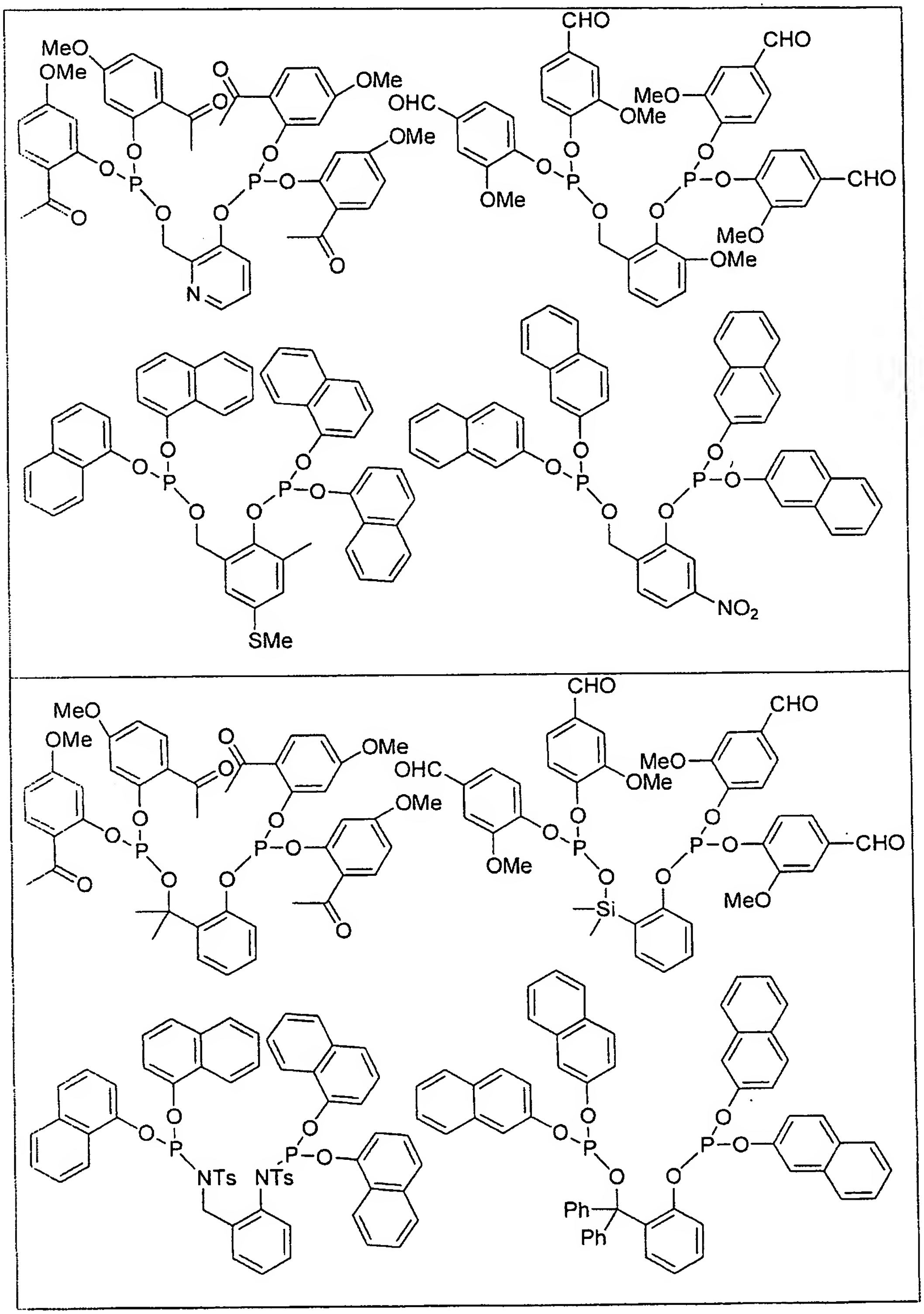
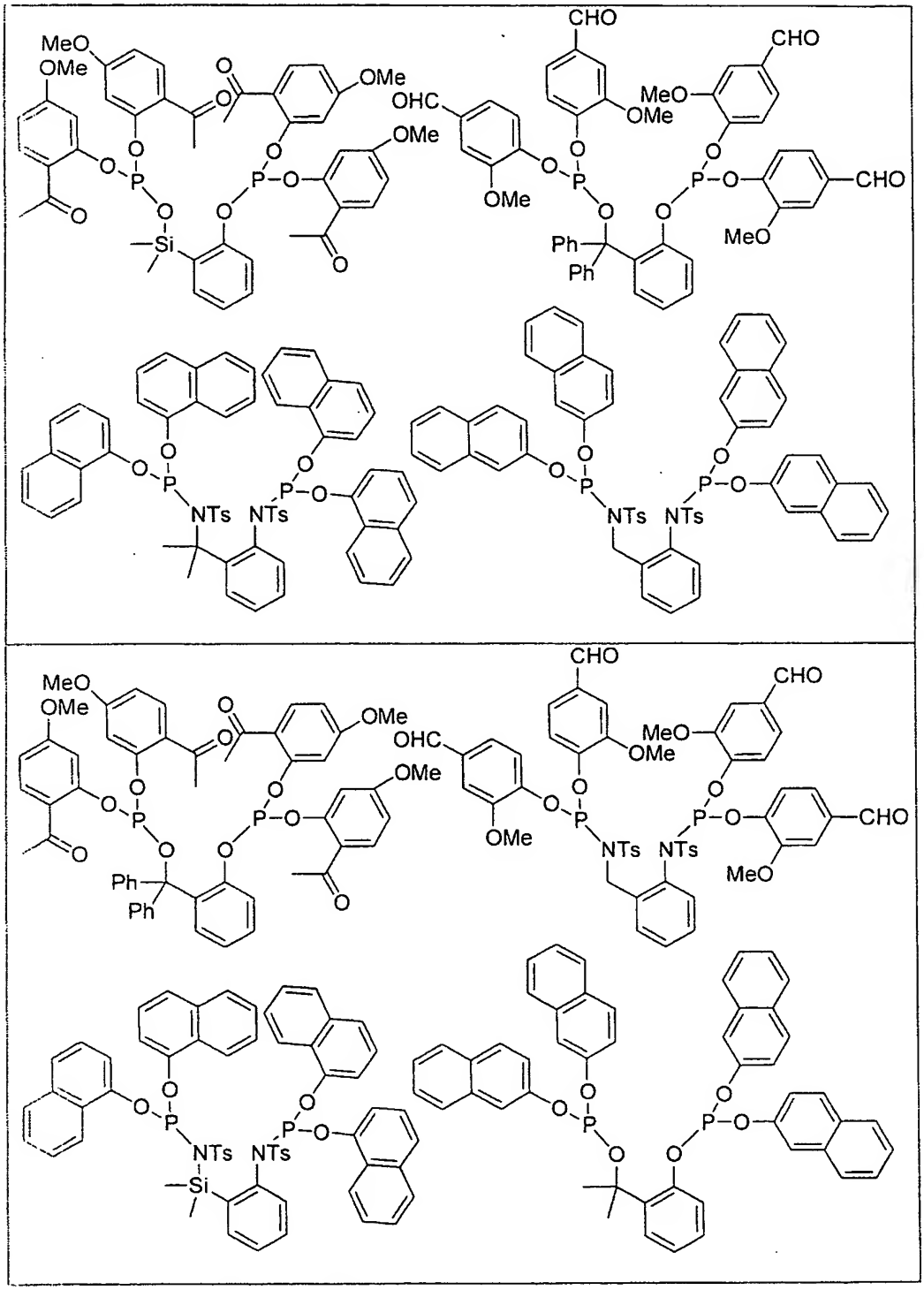
SMe
OMe
NO2
SMe

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NTs
NTs
MeO
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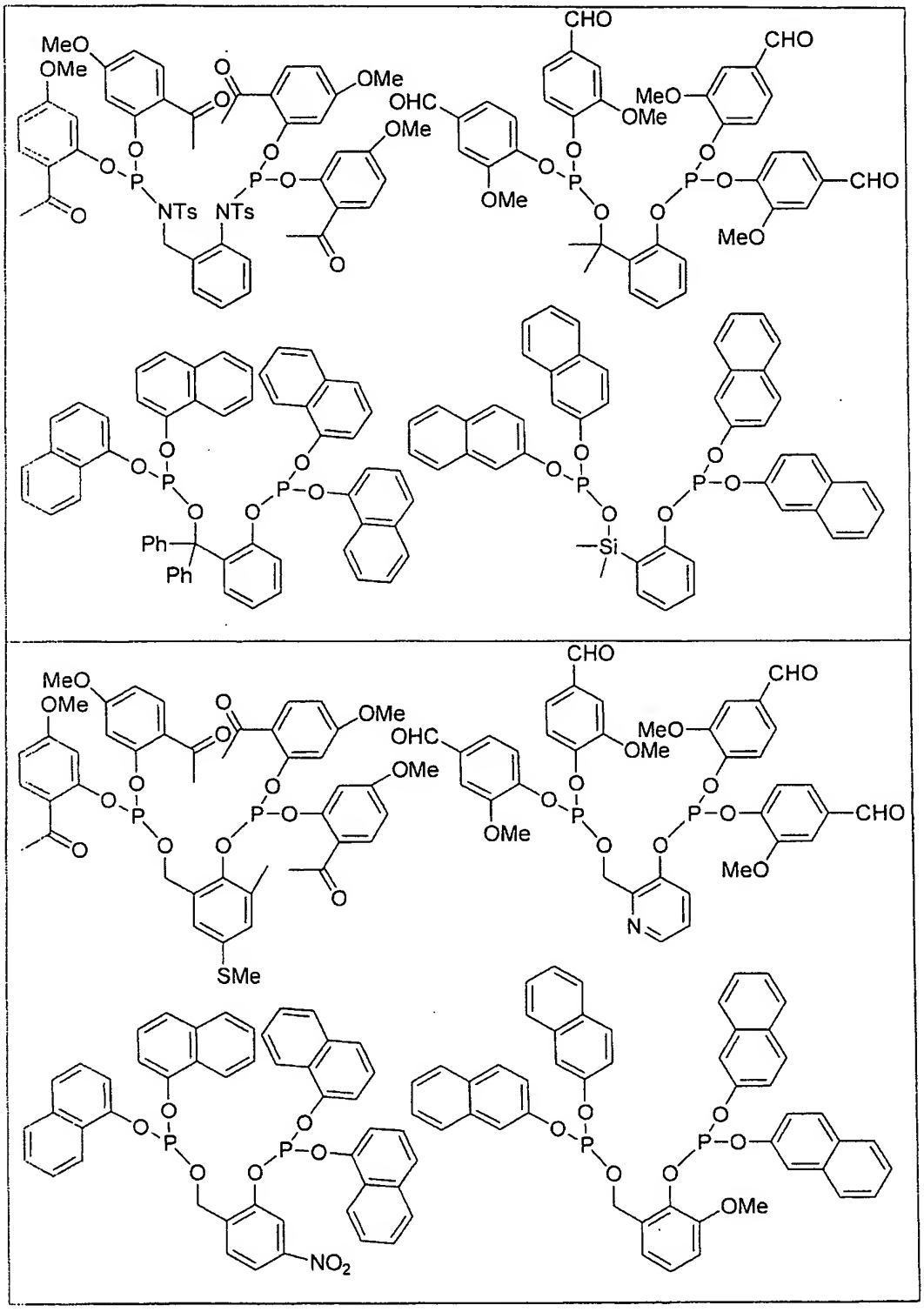
NTs
NTs
Si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CHO
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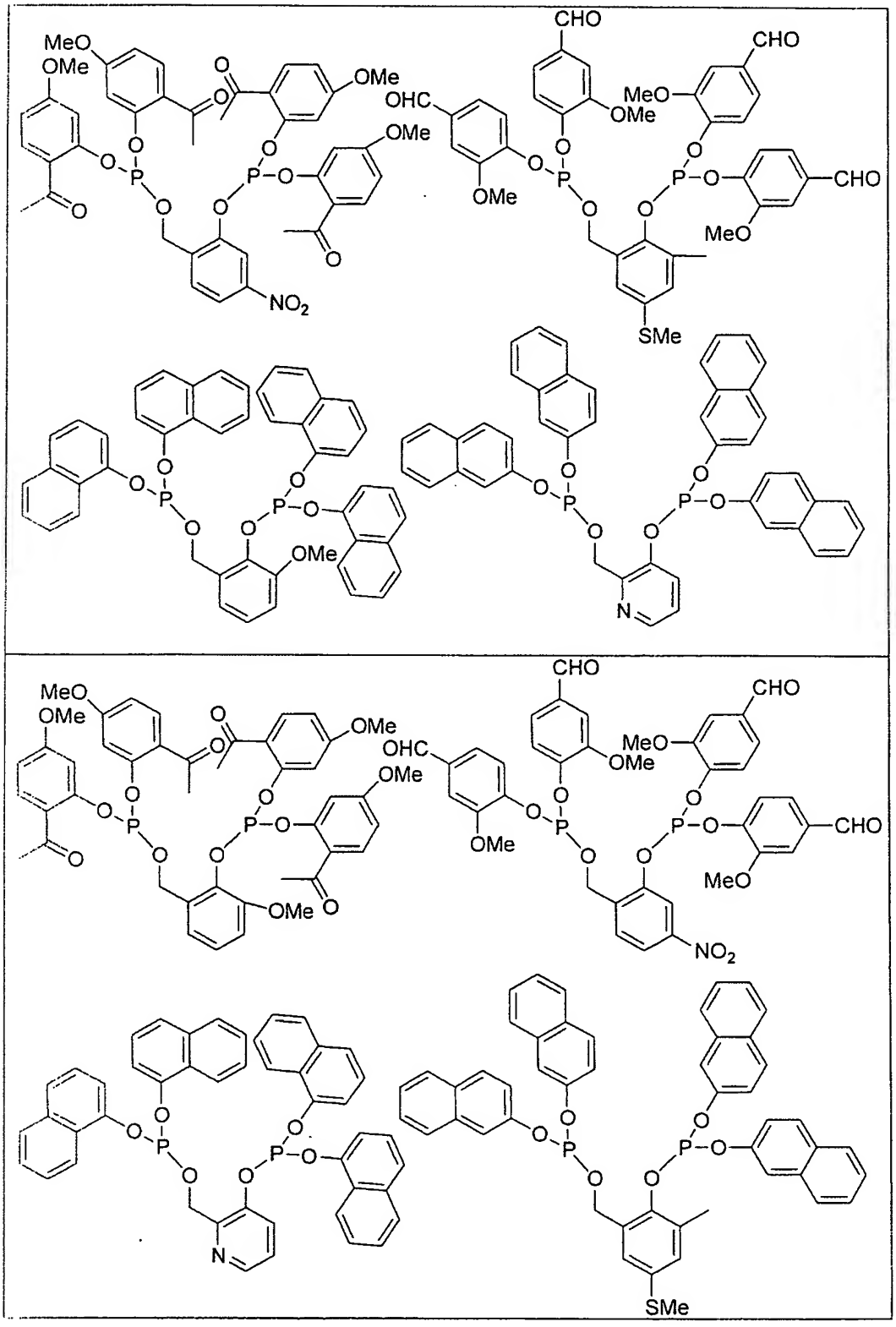
SMe
NO2
OMe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NO2
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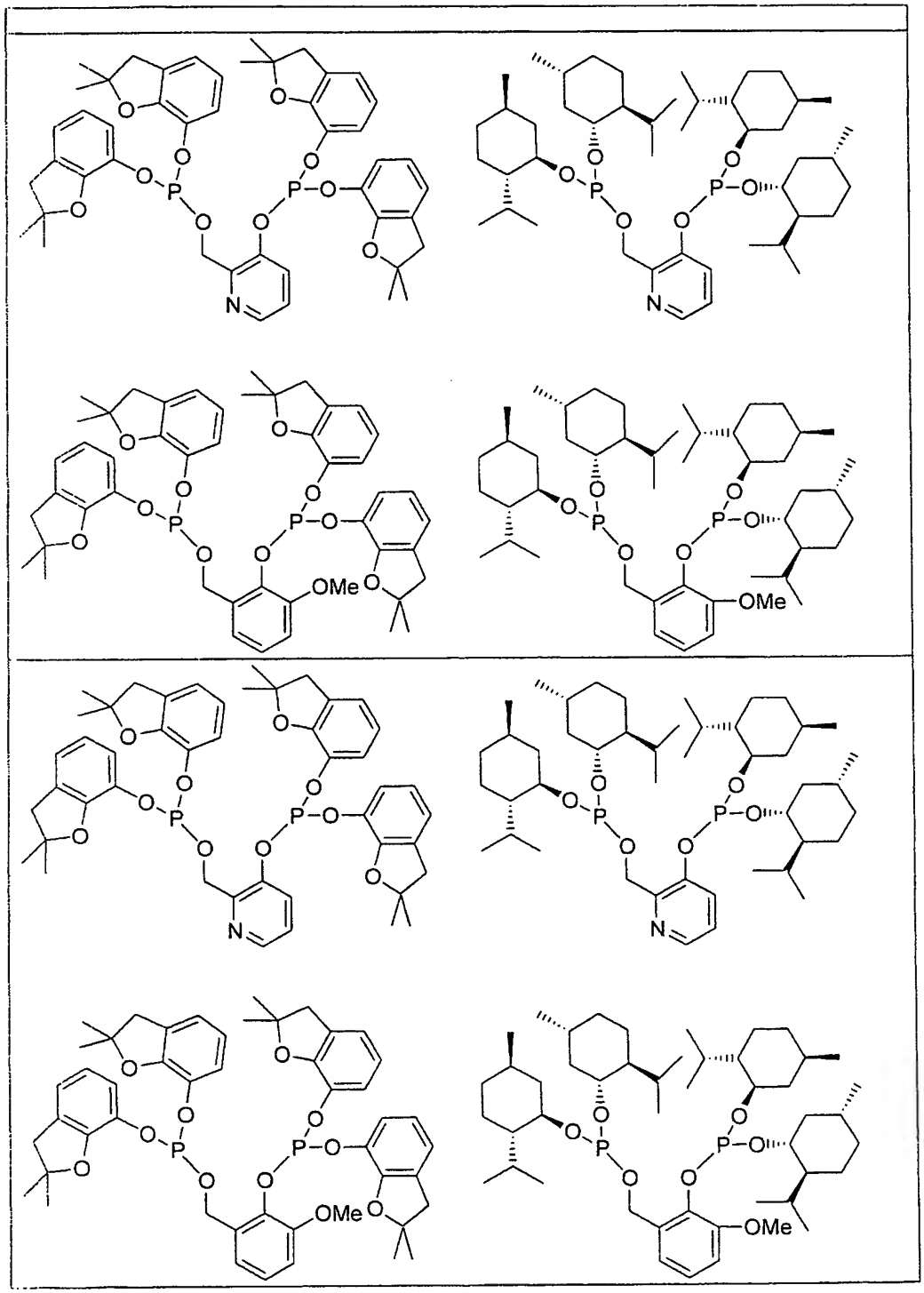

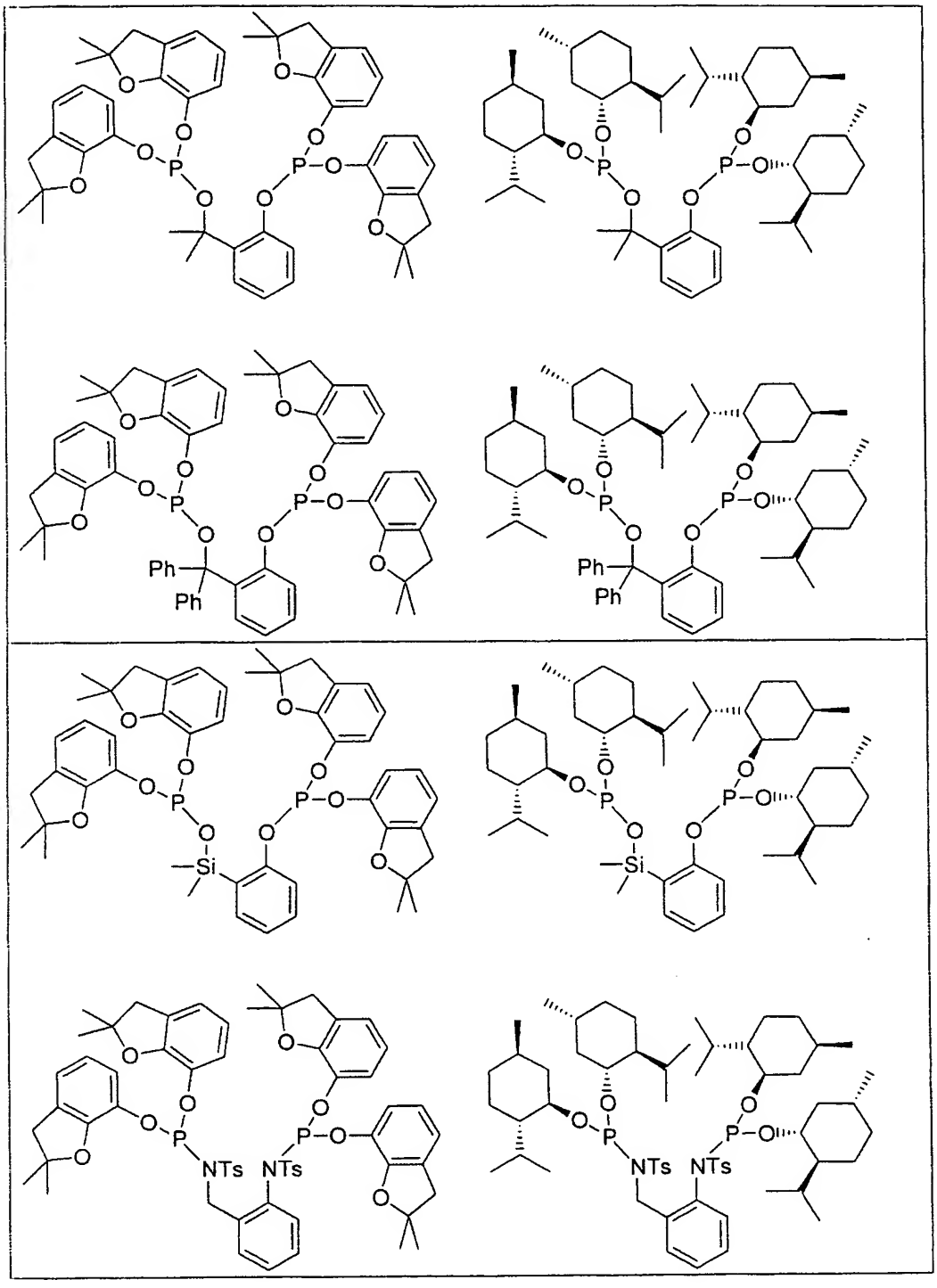
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Ph
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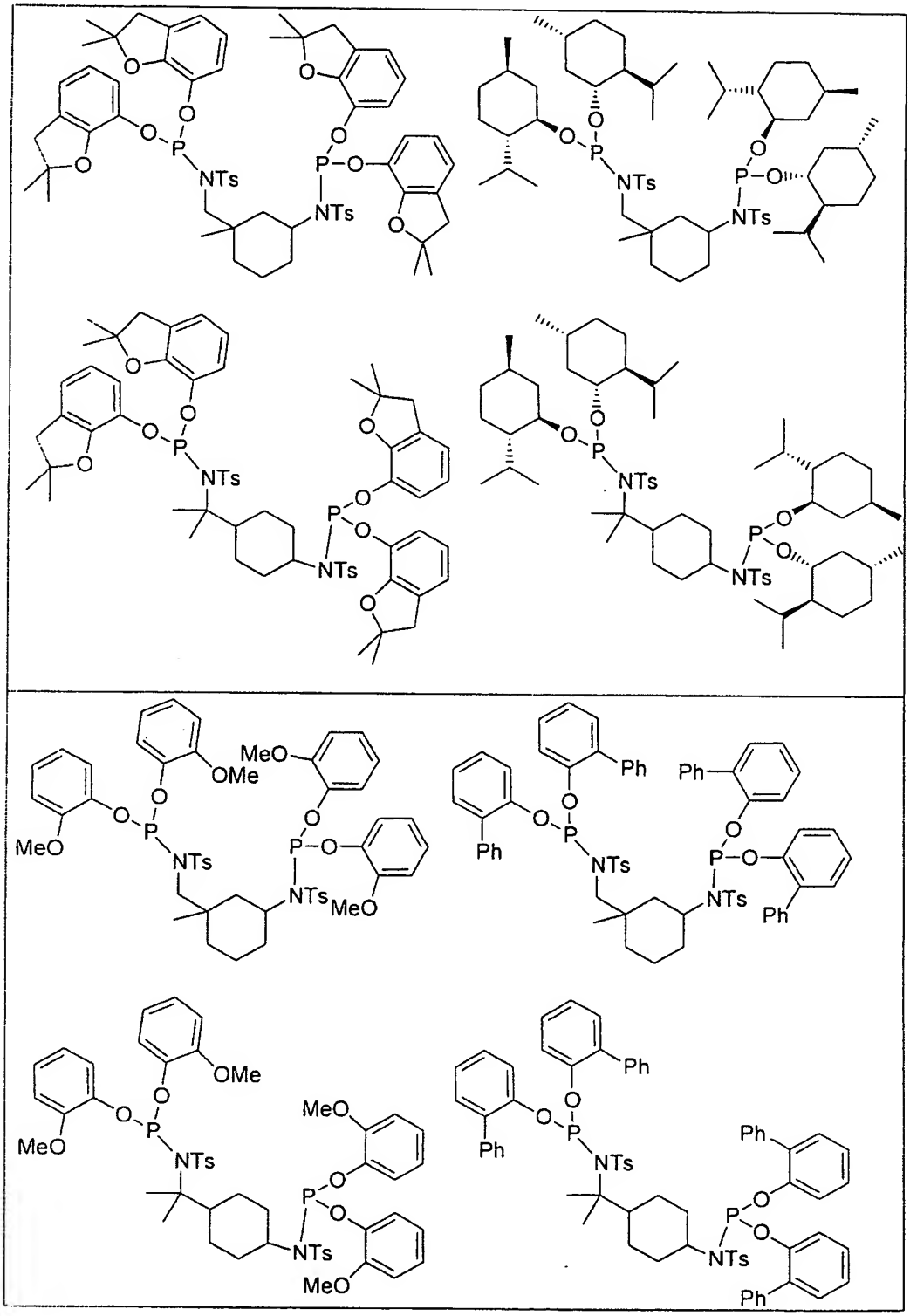
Si
NTs
NTs
NTs
NTs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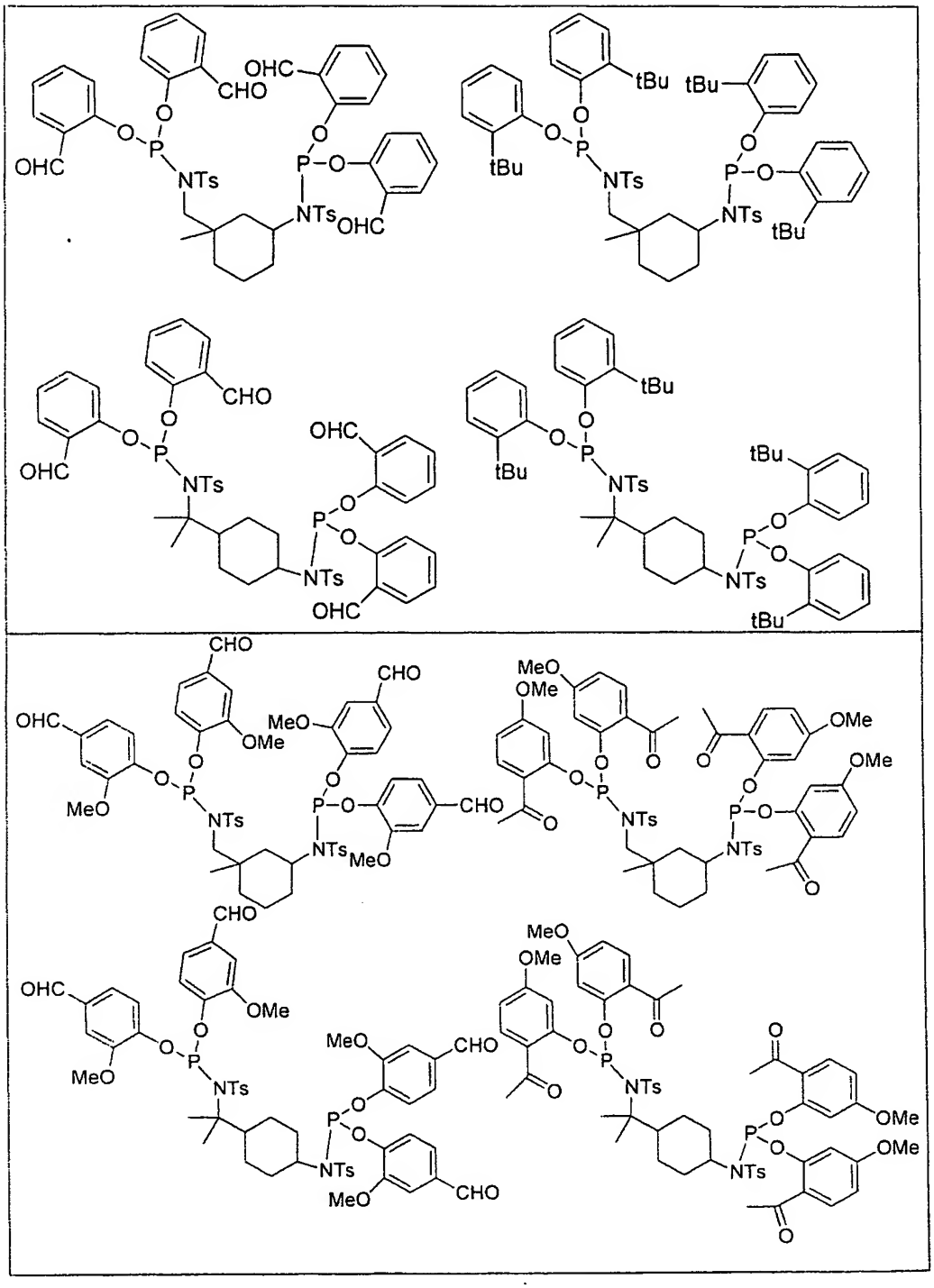
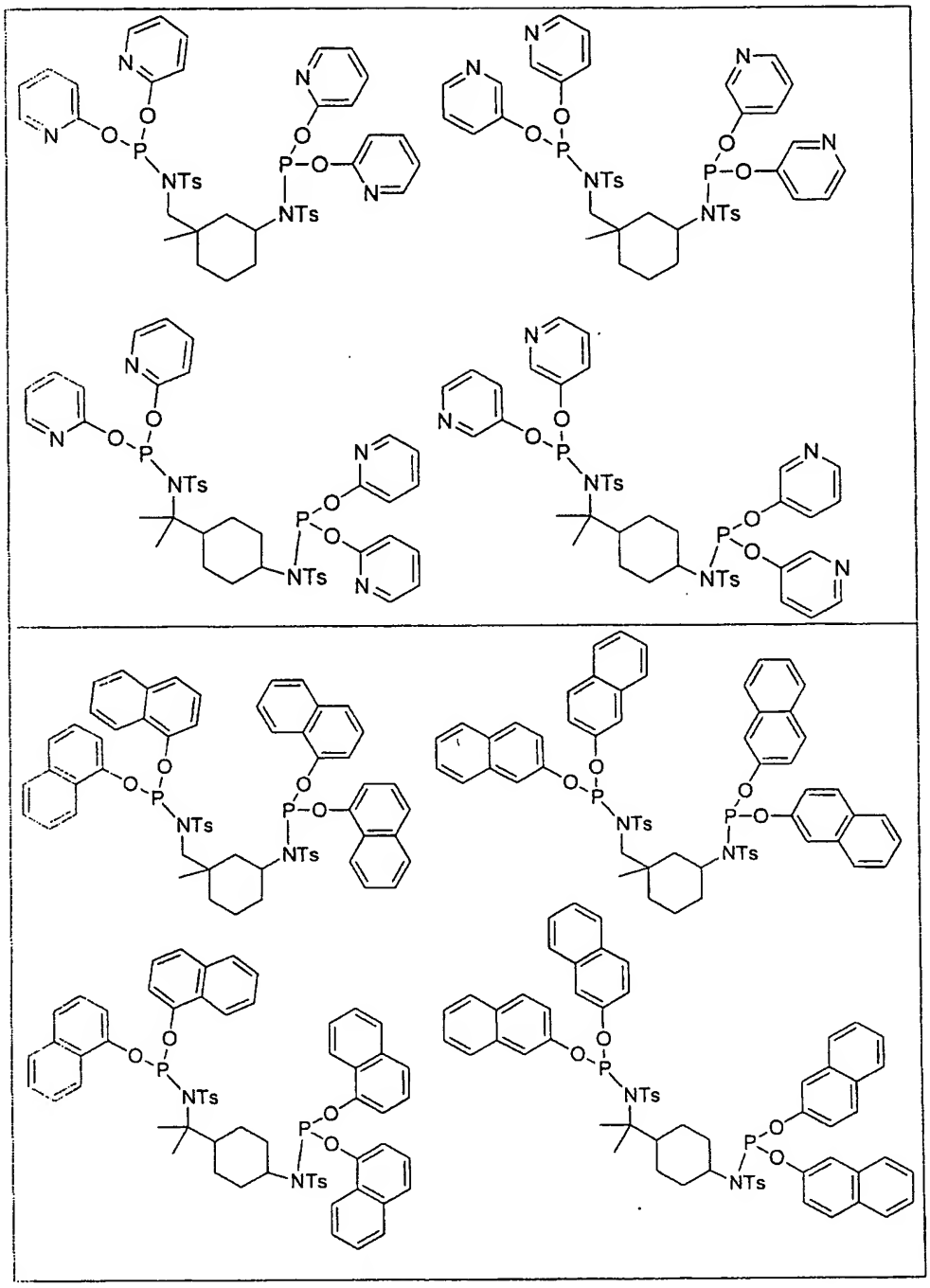
MeO
OMe
Ph

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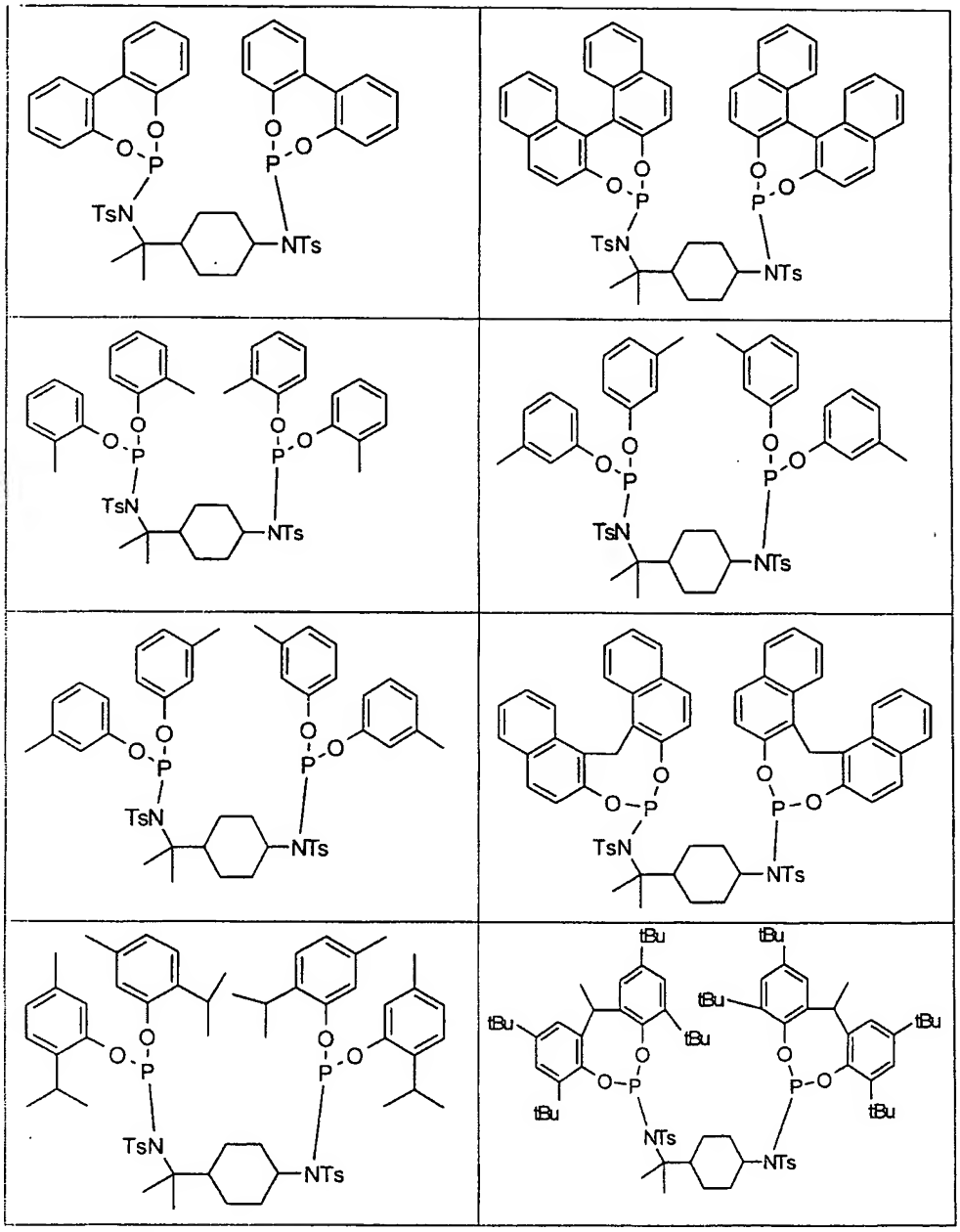
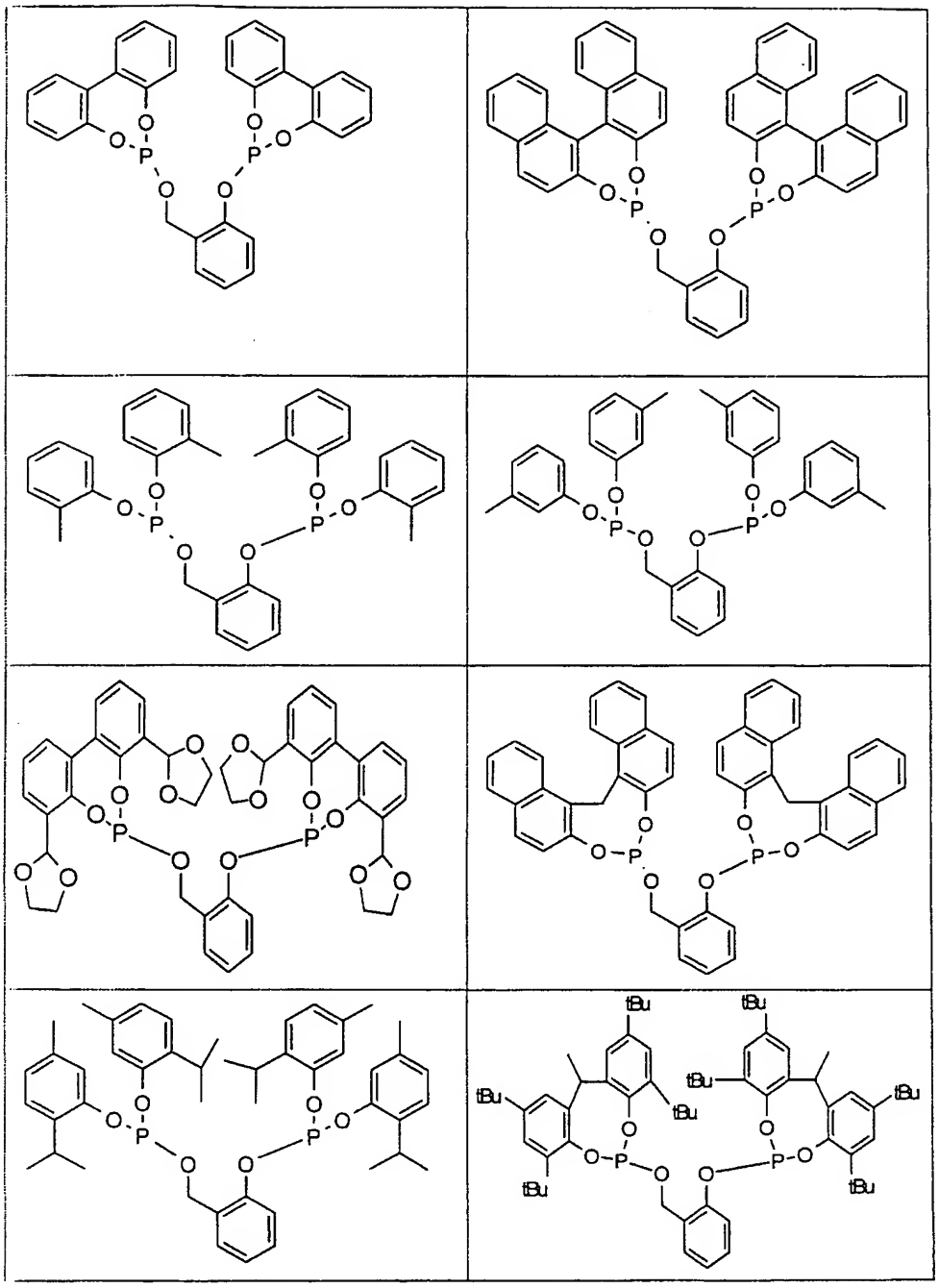
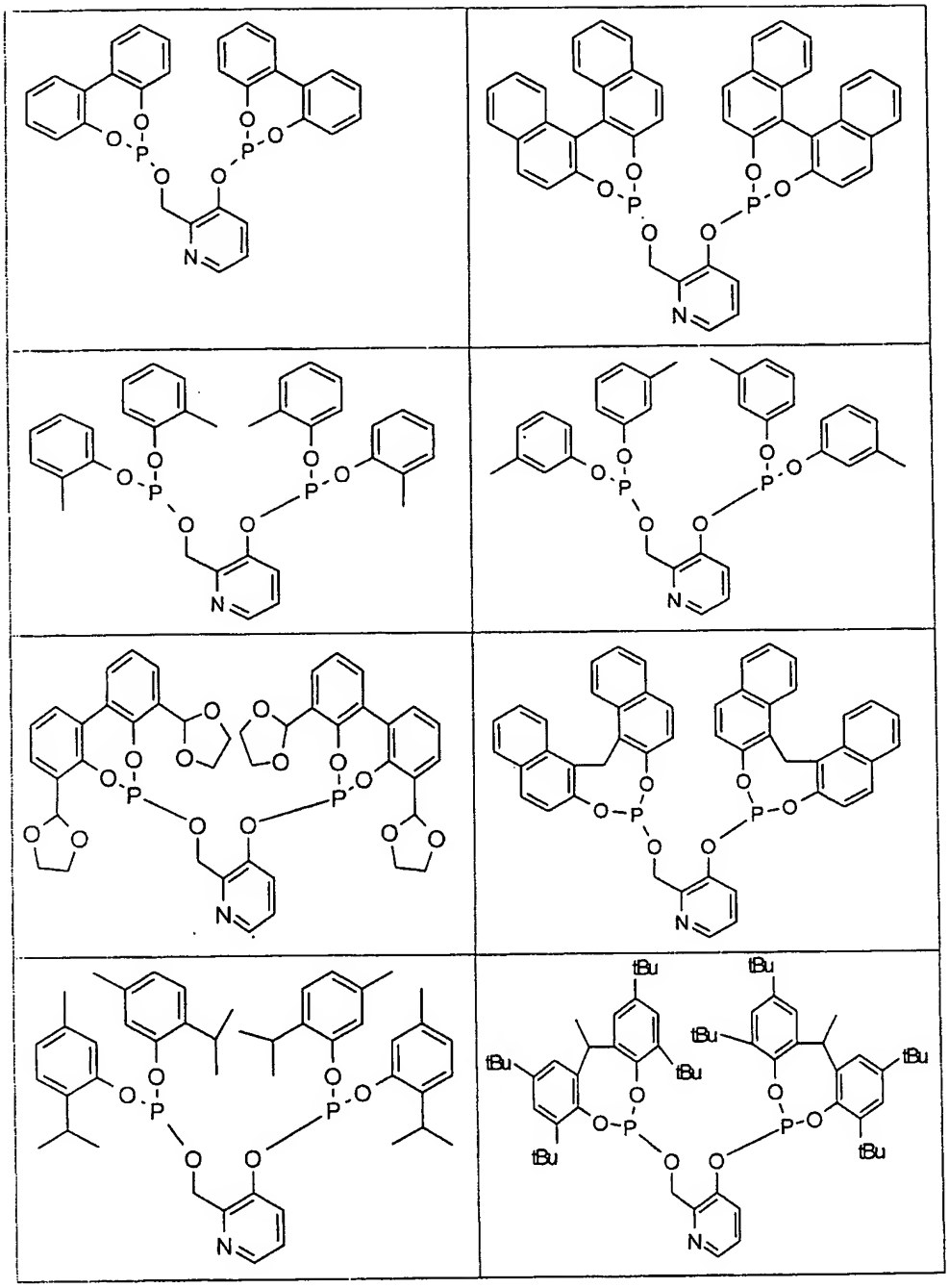
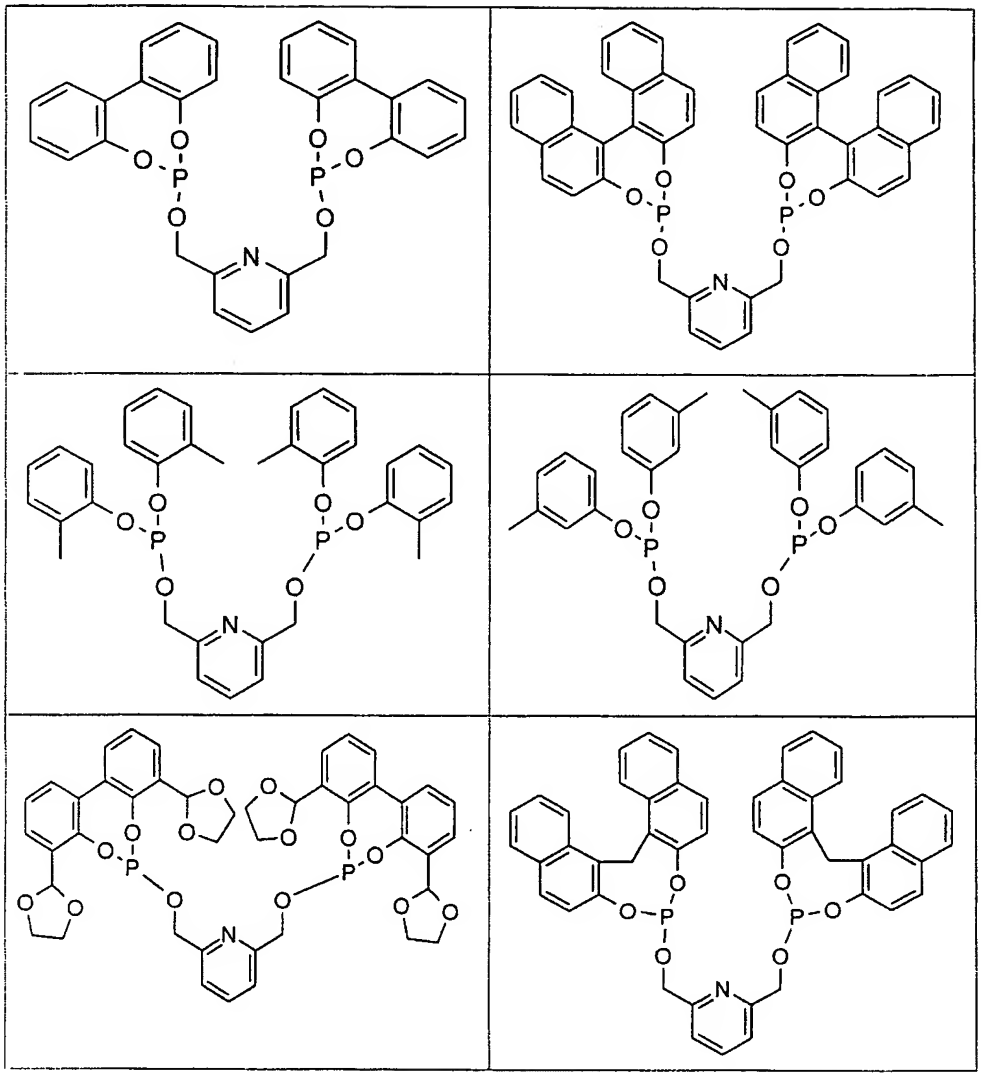
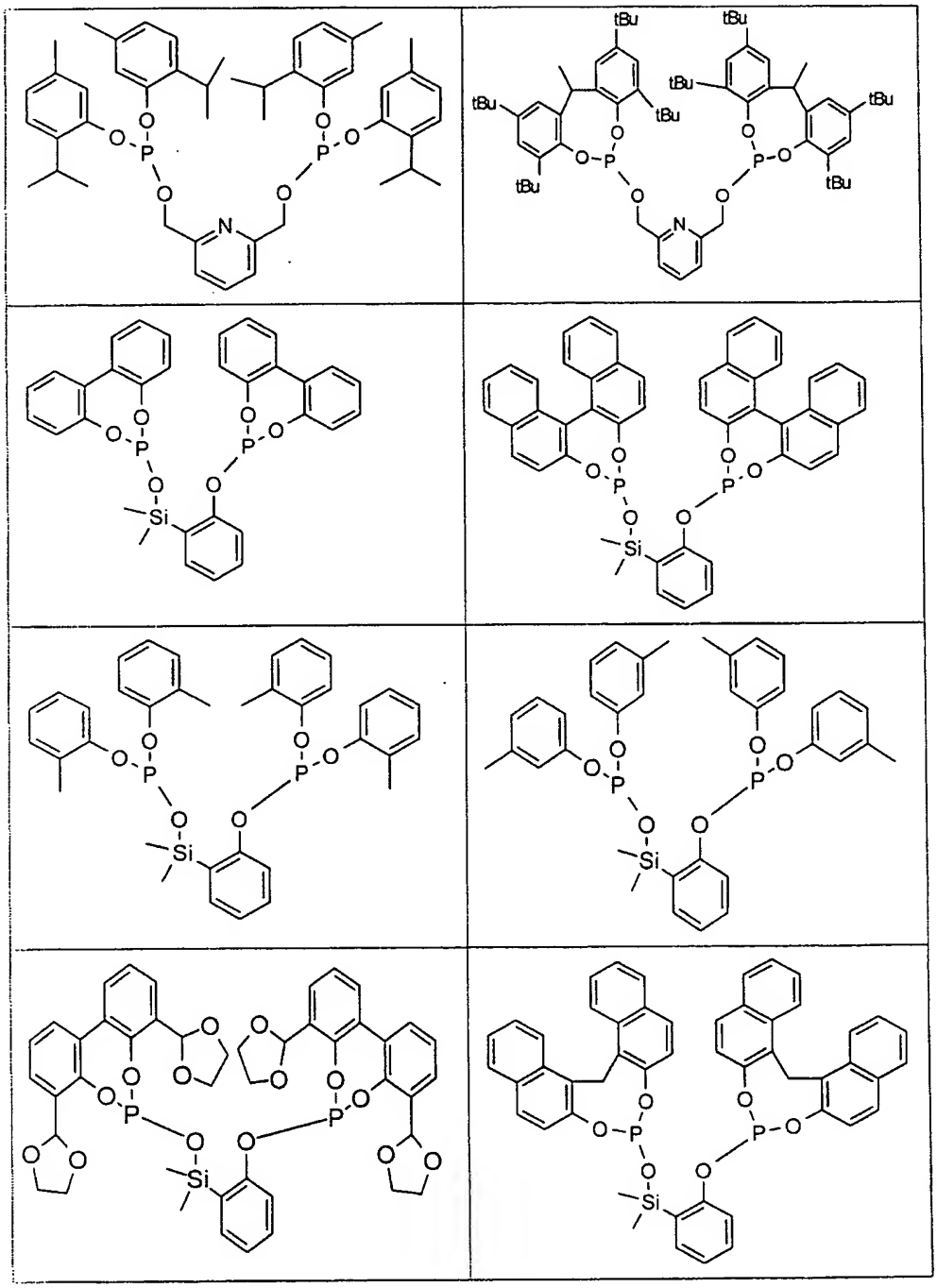
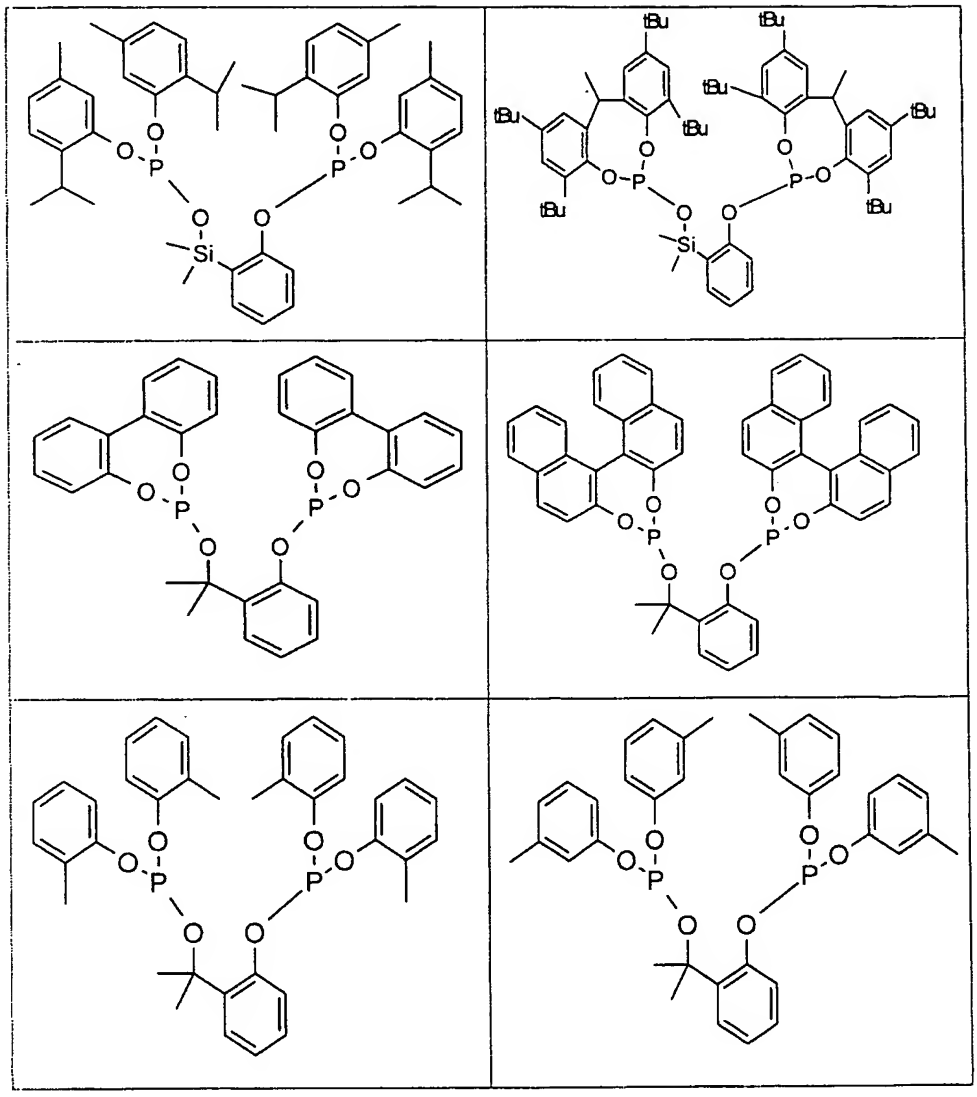

TsN
NTs
tBu








tBu
tBu
tBu
tBu
tBu
tBu
tBu
tBu
N
O
P
Si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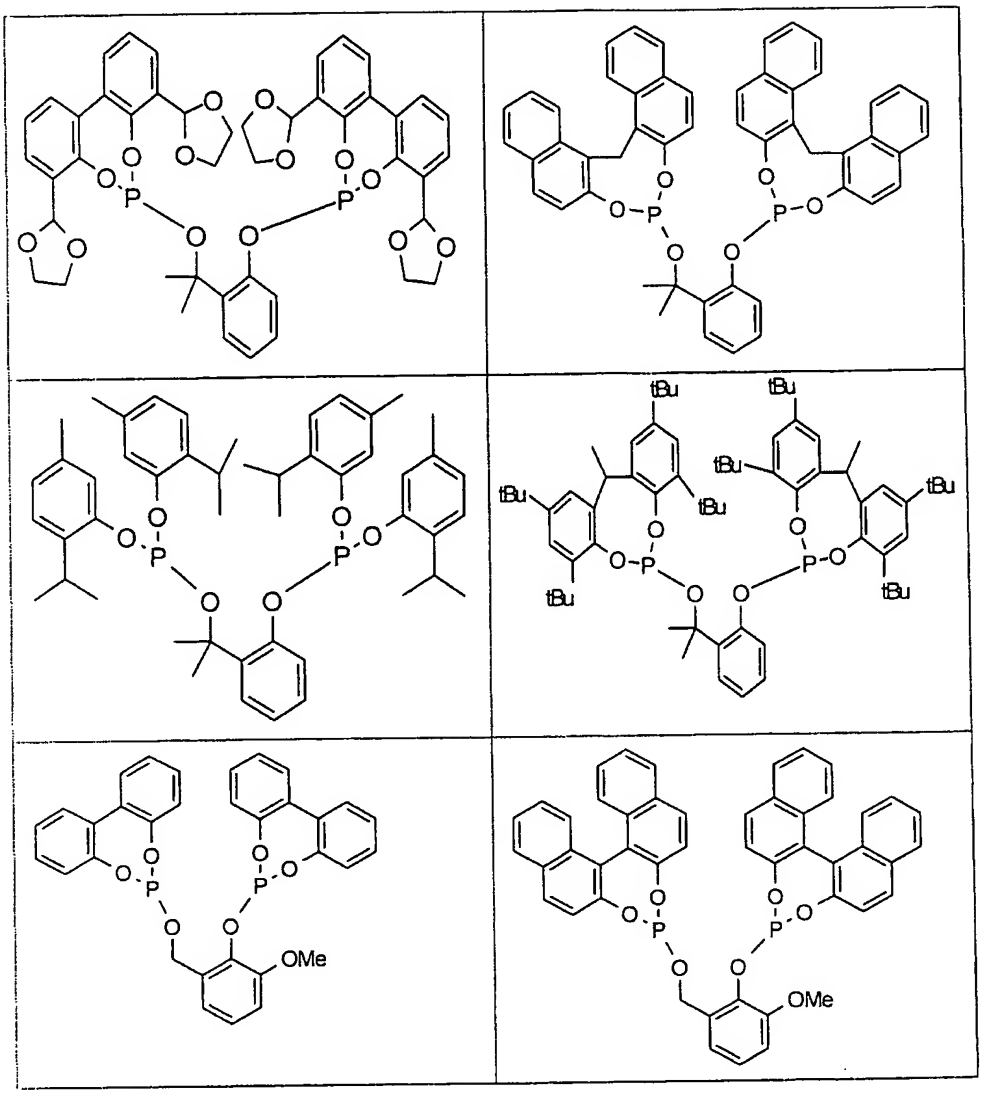
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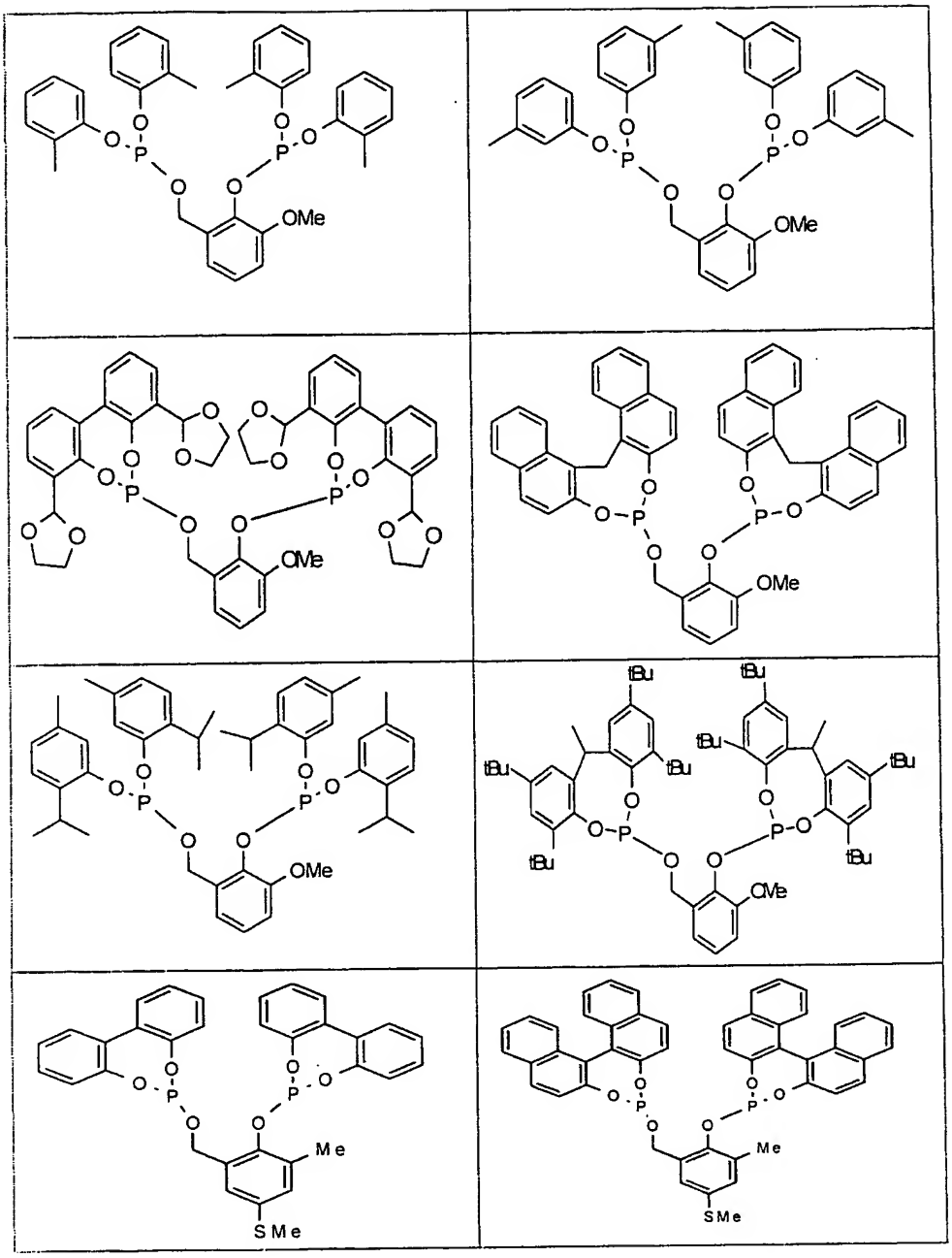
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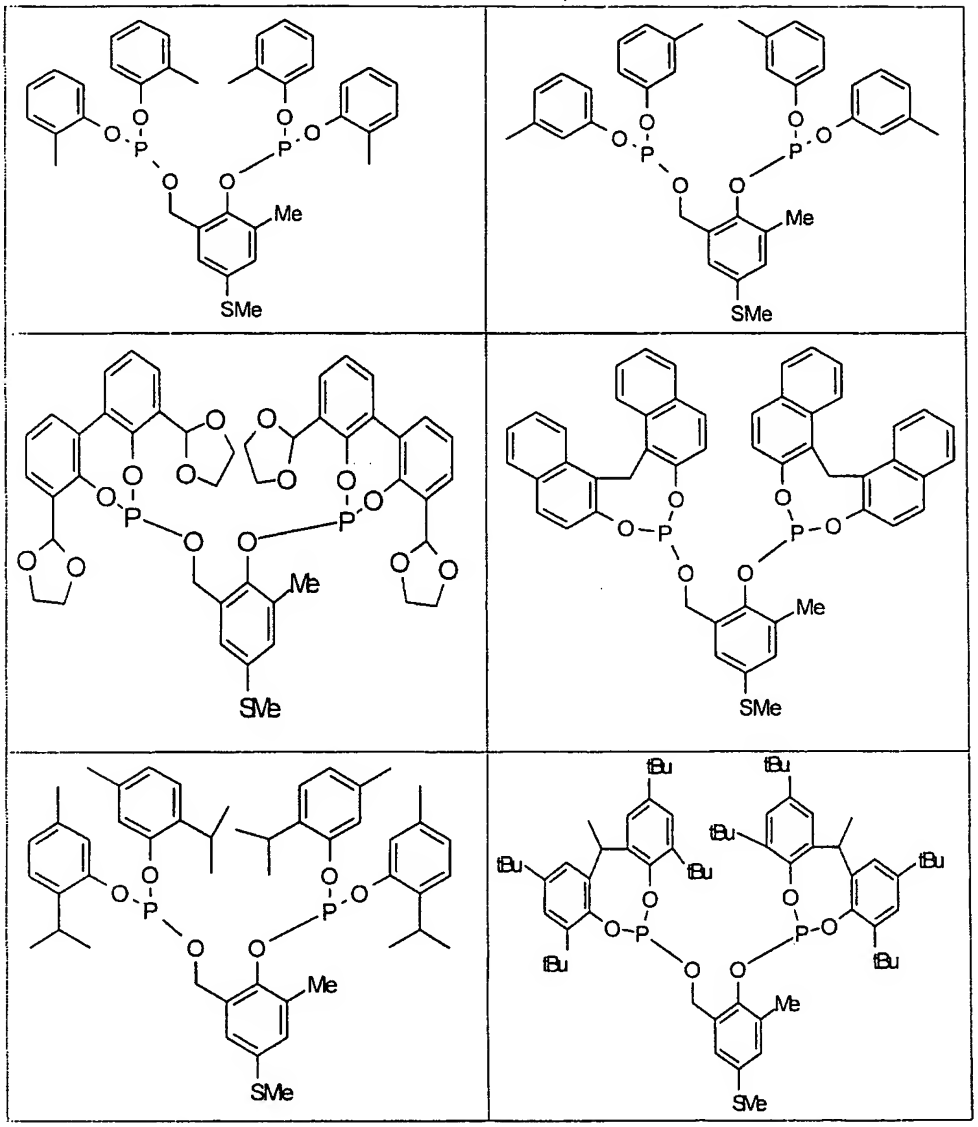
SMe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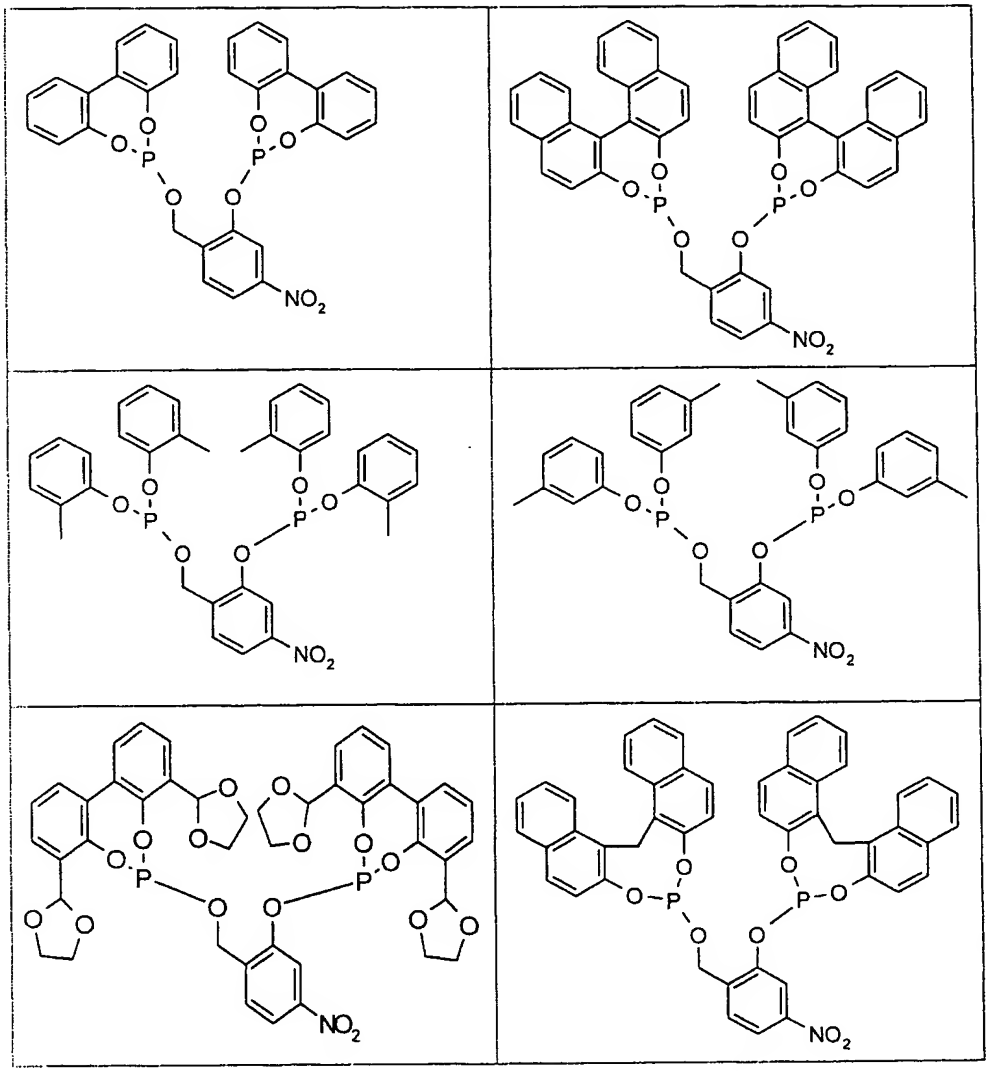
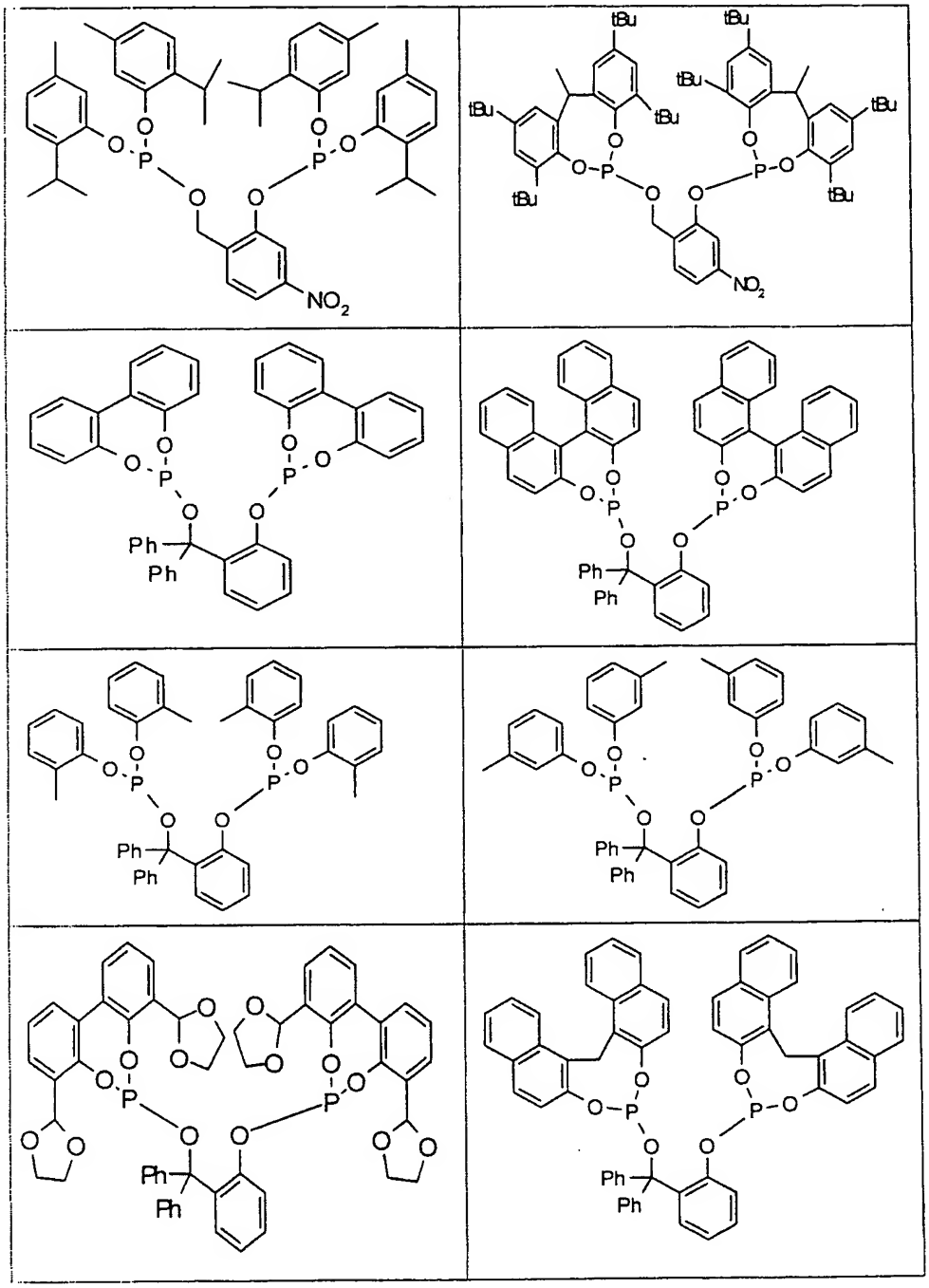
SMe

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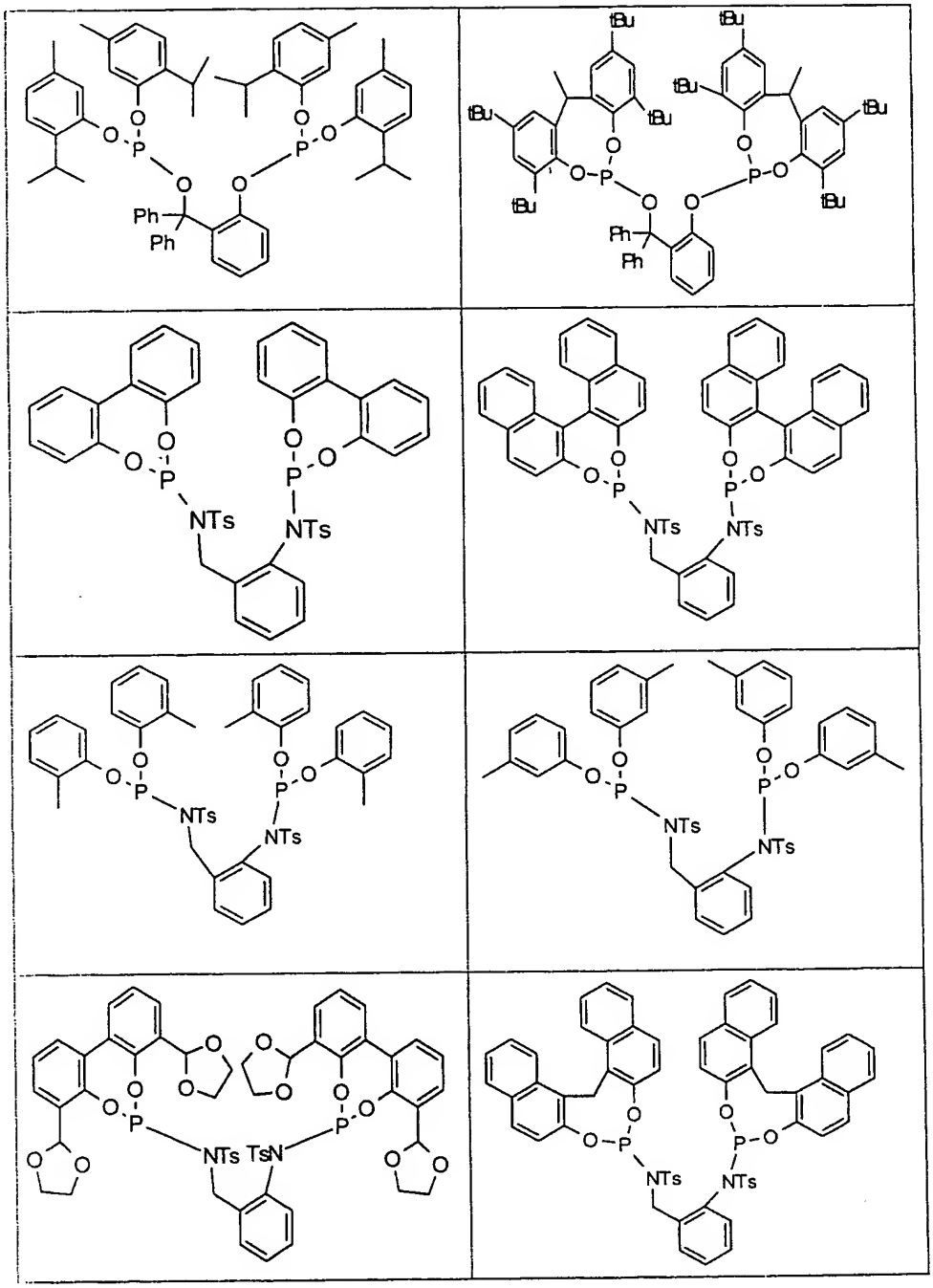
NO2
Ph
Ph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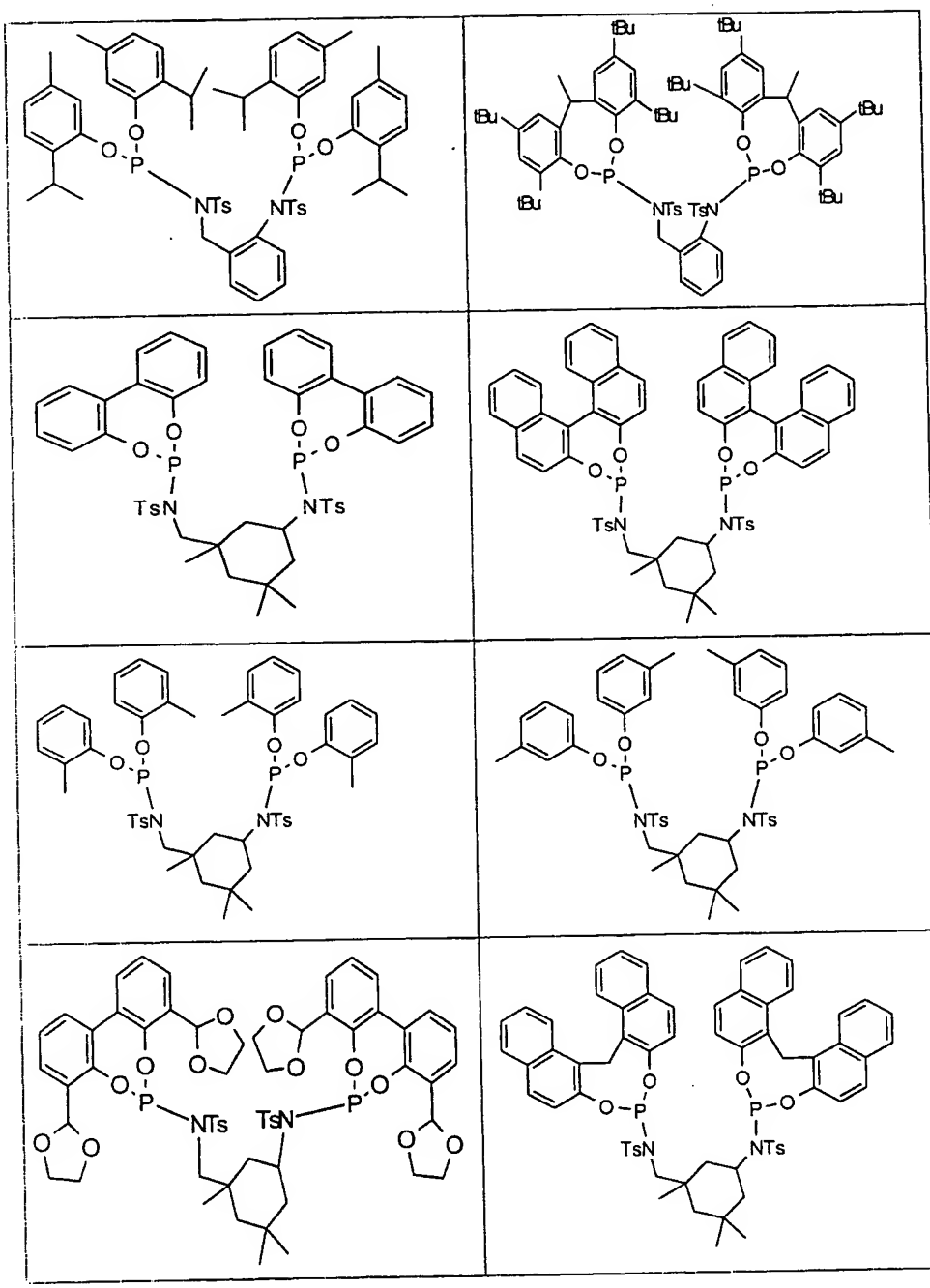
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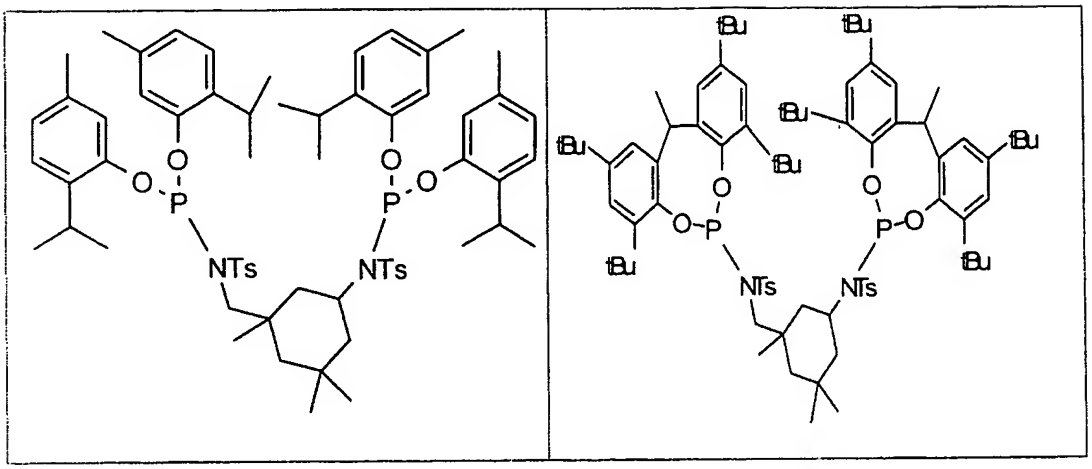
O
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NTs
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